# AMERICAN FORESTRY

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PERCIVAL SHELDON RIDSDALE, Editor

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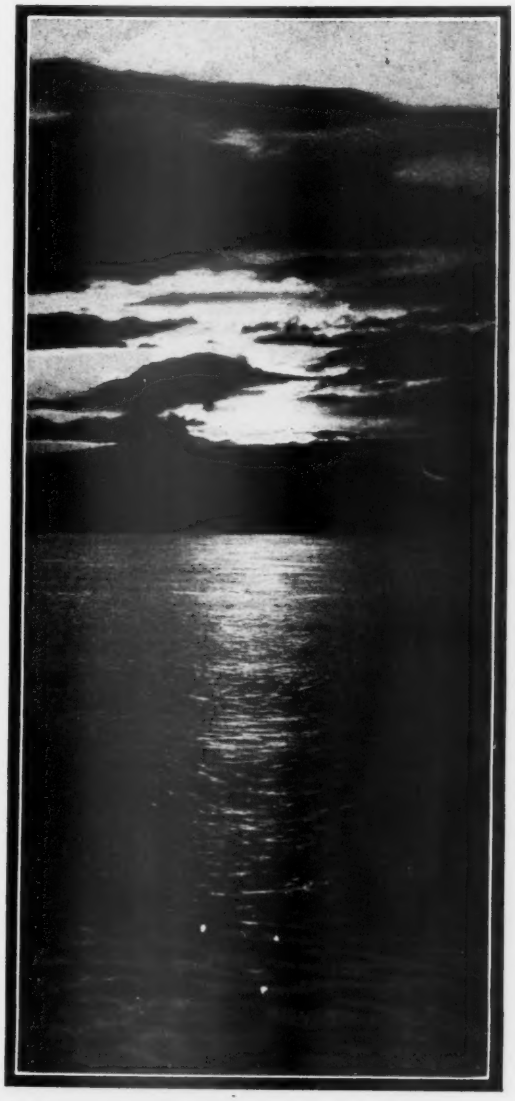

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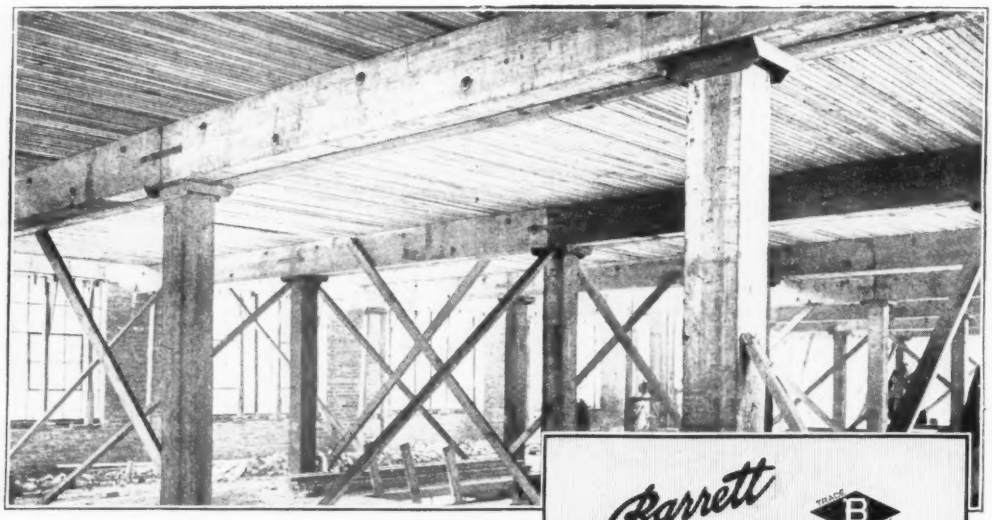

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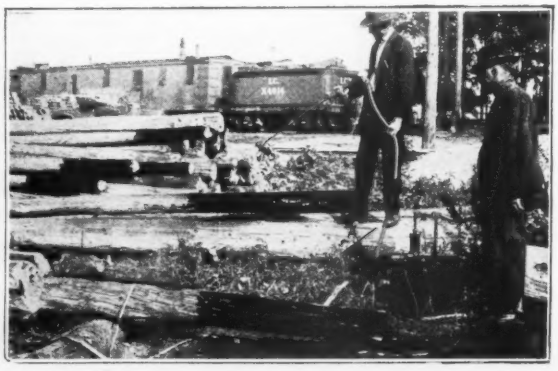

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# AMERICAN FORESTRY

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# EDITORIAL

## CRIPPLING FOREST INVESTIGATIONS

THE Agricultural bill as passed by the House of Representatives, reduced the appropriation for forest investigations in the Forest Service from $78,728 to $35,000, or more than half. This appropriation has been granted by Congress for the past eight years. The Senate Committee increased the amount to $105,000. At this writing the conferees of the House and Senate are considering this and other forestry appropriations.

The reduction of $43,728 made by the House, if finally passed, will make it necessary to close down all of the Forest Service experiment stations located at Priest River, Idaho, at Colorado Springs, Colorado; at Flagstaff, Arizona, and at Stabler, Washington. Some of these stations, like the Arizona and Colorado Stations, have been in existence for the last ten years. It will further mean a great crippling, if not the entire abandonment, of the more general forest investigations now carried on in the States of California, Oregon, Utah, Montana, and the hardwood region of the eastern United States. It will mean the dropping from the rolls of 10 or 12 men, some of whom have been in the forest research work for the last 12 or 15 years. It will mean the abandonment of hundreds of experimental plots and records secured with infinite patience and sacrifice on the part of enthusiastic investigators in the course of more than a decade. It will mean setting back the experimental work in the country for another 15 years, since in forestry it takes years of most arduous work to build up sufficient evidence for any definite conclusions and secure a complete investigation force.

If anything has proved beyond doubt its value during the war it is the application of science to modern industrial and military efficiency. Just at a time when scientific work is at last coming into its own, if it cannot be stimulated it should not at least be crippled by any near-sighted policies of economy. If any effort has more than paid for its cost it has been scientific effort. The National Research Council, the leading scientific body in this country, and the leaders of industry, all unanimously testify to this.

It is very unfortunate that this blow to forest investigations should come at a time when the people throughout the country are at last aroused to the critical situation of our timber resources and are asking for additional appropriations for experiment stations in New England, the Southern Appalachians, the Lake States and southern California. This demand on the part of an awakened public opinion manifested itself in the introduction of eight bills now pending in the House and Senate and providing for the establishment of new experiment stations in different parts of the country.

This drastic reduction in the appropriation for forest investigations is a very near-sighted economy at a time when the exhaustion of our timber resources is so clearly in sight, when the prices for lumber have reached levels almost prohibitive for the ordinary user of wood, when many industries in the United States today are suffering because of a shortage of wood supplies, as is too clearly manifested by the critical situation in the production of newsprint, and when the country needs more than ever before knowledge as to the best handling of our remaining timberlands. The question of a National Forest policy for the country is now being widely discussed by the wood-using industries, in trade journals, and the general press, and there is no doubt but that legislation of one kind or another will be sought in the near future to provide for measures which will protect the remaining forests from devastation and encourage forest practice by private timber owners as well as by States and municipalities. All such measures, unless they are based on accurate scientific knowledge of the best methods of handling the timber lands and securing natural or artificial reforestation, may prove of little effectiveness. Forest experiment stations are just as indispensable to the growing of timber as agricultural stations are to the production of farm crops.

The curtailment in the appropriation for forest research is particularly deplorable because it comes at a time when the forest experiment stations are just beginning to reach the period of their greatest efficiency and usefulness.

Forest investigations on the National Forests resulted in increasing the revenue from them by developing methods of cutting which, as in the case of the Douglas fir on the Pacific Coast, have saved thousands, if not hundreds of thousands, of dollars to the Government in the form of timber which otherwise would have to be left for seeding purposes. Some of the discoveries made at the stations repaid to the Government many times over the entire cost of all expenditures for their establishment and maintenance for many years to come. Their elimination in reality means, therefore, not economy, but a loss since without them increase in productivity of our forests must be trusted entirely to chance.

## PROTECT THE HEADWATERS OF NAVIGABLE STREAMS

THE wisdom of purchasing forest land at the headwaters of navigable streams under the Weeks Law has been demonstrated. When, therefore, the appropriations have been used up, and the question arises of continuing the policy, the appeal is wide and strong. New bills in Congress propose two million dollars a year for five years.

But Congress does not grant large sums without knowing the reason, especially in the face of an expected deficit of three billion dollars in the year's payment on the war debt. It is up to the friends of this measure to show its transcendant importance, and this can be done. It involves not only the timber supply in the Eastern country where population is dense, and the preservation of the soil over vast tracts of mountain range from fire and erosion, but also the even flow of streams and the regulation of water powers in more than twenty states with hundreds of thousands of operatives dependent upon steady power at the millwheels.

Take, for instance, the regulation of stream flow in any single valley in New England like the Connecticut or the Merrimac. Each has hundreds of factories and electric plants. What myriads of electric lights depend upon an even flow from the great White Mountain watersheds. Or, take the Ohio River. Any one who has experienced the terror of floods at Pittsburgh or Cincinnati when millions of property are destroyed and many hundreds of people driven from their homes, realize how essential is control in the mountains of West Virginia. Forest soil is said to hold back five times its own weight in water. It is this extraordinary fact that keeps mighty rivers flowing. Members of Congress and everybody else should know that this precious mountain soil is inflammable and that a slash fire destroys it ten thousand acres at a time. Whole mountains are reduced to barren rock.

Or take the matter of timber supply. In the country as a whole, as everybody knows, we are using up our timber much faster than it grows. Already we are feeling the pinch of excessive prices, due to the exhaustion of certain species. Lumber prices have greatly advanced and yet felling operations throughout the highest mountain slopes are advancing as never before. Near the summit of Mt. Mitchel, in North Carolina, at an elevation higher than Mt. Washington, one beholds the worst timber slash in Eastern America, with the black crisp soil where fires have swept over thousands of acres. Pitiable and damnable are the adjectives most appropriate; pitiable because the country has not seen the facts, and damnable because the results are everlasting.

The American Forestry Association has supported the Weeks Law first, last and all the time. It stood for the original appropriation of eleven million dollars that was passed by Congress and approved by President Taft in 1911. It urged in 1916, the reappropriation of the three million dollars that did not become available under the first act. It favored action by the present Congress that made an appropriation of $600,000 last July to continue purchases for the current fiscal year.

If the American people believe in this enterprise, now is the time to say so in tones that Congress cannot fail to understand. Nothing but a majority of votes in both Houses of Congress will secure its continuation.

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## TAKING ADVANTAGE OF THE FARMER

COMPARATIVELY little attention has been called to the profiteering in timber which some small sawmill operators, owning chiefly portable or semi-portable mills, have been practicing in this country. Reference is made to their buying stumpage at low rates largely from farm woodland owners. It is not a new form of taking an undue profit. There is no way of telling what percentage of small operators practice it, but it would seem that many of the operators in various sections resort to it. The effect upon the honest operators is obvious, it lays them open to suspicion, makes it more difficult for them to do business with timber owners, and puts them at a disadvantage financially. It is to their interests, to the interests of farm woodland owners, and in the interests of the practice of forestry in the United States, that this profiteering be stopped.

Standing timber on farms lends itself easily to profiteering, due in the main to three facts.

The first is that, in the very nature of things, there being so many variable factors, the value of stumpage can not be determined with the closeness of the value of a calf or a crate of eggs.

The second is due to the common methods of selling it, by the lump sum for the tract, or at a stated price per acre without estimate on the part of the owner.

The third is the average farm woodland owner's unfamiliarity with the business of sawing and selling lumber and other products, a business in itself.

One cannot blame the sawmill man for buying as cheaply as he can. The writer knows one firm which never attempts to force down a farmer's price. This particular firm was offered, and it purchased, several million feet in well located small tracts in the last year at about $6.00 per thousand feet on the stump. Quite a proportion of this timber was second growth white pine and white oak. It would have been cheap at twice the figure paid. The attempt, however, to force down figures by claiming a high percentage of the timber to be defective when such is not the case, of grossly under stating the total amount of stumpage and assuring the owner positively of the truth of the figures, of trying to "beat

down" the price on the ground of long-standing friendship of the families—the writer knows instances of each of these—and other unfair practices, cannot be condoned.

Many farm woodland owners will not pay any real attention to growing timber unless it pays them in dollars and cents to do so; they cannot make their operations profitable at the price profiteers pay for timber. The country's needs demand that their lands be made as productive as possible. Profiteering in the timber of our farms must cease.

## RIGHT ABOUT FACE TO THE FIRES

THE forest fires in the Northwest last summer and in Minnesota the year before challenge the effectiveness of our work in forestry. They point sharply to the immediate, urgent need in the woods of the North and West. Thousands of acres of timber and of young growth are destroyed every year or two, and dozens of lives are lost.

No measures for the establishment or maintenance of productive forests, other than fire protection, are worth while until adequate fire protection becomes an accomplished facts. Forest plantations, and special fire protection on publicly owned lands are both accomplishing a little, but the progress is far too slow, and very expensive. The result is net loss. The woods call for adequate fire protection now, on the privately owned lands. Protection of natural young growth from fire is the cheapest, most effective method of reforestation.

The methods of fire prevention and control in the various types of forest are well understood, and adequate results are possible.

Democratic government is instituted to protect life and property. When timber was cheap and abundant, lack of fire protection was excusable, but this condition is past. Protection of forests from fire, like protection of any other property of value, is a normal, police duty of government. It can be administered practically under the authority of the state governments, or by co-operation of the Federal government with the state governments, and expenses can be met under any one of several co-operative methods between the Federal and state governments and the landowner, as local conditions may render practical.

The work to be done now is to make certain that appropriations and legislation for thorough fire protection have the right of way.

## A NATIONAL FOREST POLICY PROGRAM

DR. B. E. FERNOW, in an editorial utterance in the *Journal of Forestry,* says of the action of the American Paper and Pulp Association in accepting a report of its committee on Forest Conservation with suggestions for a national forest policy: "It takes the position that there is 'no basis for any legal compulsion upon the private landowner to keep his land forested except in cases where after proper classification and indemnification it may be decided that the general welfare demands watershed protection,' but it admits that the private owner 'is under both moral and legal obligation to handle his property in such a way that it does not become a public menace and the State may require him to conduct his cutting operations in such fashion as to lessen the fire danger.' It declares that 'the production of large-sized timber is too long an undertaking with too great hazards and too low a rate of return to attract private capital in adequate amount.' It advocates a forest survey and land classification; public purchase of cut-over lands by National and State governments in co-operation, and also more vigorous extension of Federal co-operation with the States in fire prevention; fair forest taxation laws; a very large program of forest planting; nurseries and working plans and other means of aiding reforesting operations, especially for smaller land holders; and a definite policy in operating State-owned lands. It is also admitted that some paper and pulp concerns might practice forestry on their own lands.

"With this attitude and program," says Dr. Fernow, "we can certainly not find any fault. It expresses all that we have contended for as practicable means for carrying out a national forest policy. What we need now are definitely drawn acts of legislation."

## SHADE TREES AND FOREST CONSERVATION

IN his Arbor Day proclamation the Mayor of Dallas, Texas, not only calls attention to the value of shade trees but adds this significant paragraph: "The forests of this nation and of this state are being depleted to an alarming extent. Insect pests and enemies of trees are rapidly increasing, and it behooves us to adopt strenuous measures to save the trees we have, and to insure a source of timber supply for the future."

The Mayor recognizes the fact that if people are interested in shade trees they are likely to be receptive of ideas about forest conservation. Editors throughout the country who have been giving liberally of the space in their newspapers to forestry publicity and shade tree publicity have frequently expressed the same thought in their editorials, and we read of many organizations which having planted roadside trees or memorial trees are now discussing the need of a national forest policy, and are ready to lend their assistance in the effort to secure it.

COLONEL W. B. GREELEY

WHO HAS BEEN APPOINTED CHIEF OF THE UNITED STATES FOREST SERVICE IN PLACE OF COL. HENRY S. GRAVES, WHO HAS RESIGNED. COLONEL GREELEY IS A DIRECTOR OF THE AMERICAN FORESTRY ASSOCIATION.

# FORESTRY IN THE DOUGLAS FIR REGION

BY THORNTON T. MUNGER, UNITED STATES FOREST SERVICE

"WESTWARD the course of empire takes its way!" The expanding population of our country moved westward and as it went it took with it all the pulsing activities that accompany the modern industrial empire—the making of cities where none were before, the construction of Herculean transportation systems, the establishment of industries to supply the needs of the people, the eager harvesting of the great wealth of natural resources. It was primarily the wealth of natural resources that directed the march of progress to the westward in this country—the virgin fertility of the soils, the mineral riches of the mountains and the vast expanses of splendid forests. Following closely on the steps of the prairie schooner emigrants who came to till the rich Western soil and of the Forty-niners who came to mine the Western gold, came the lumbermen to harvest the primeval crop of timber which Nature had sowed and which stood ripe for the ax. The lumber industry has been moving westward with the march of progress; it has always been a pioneer industry, one of the forerunners of intensive industrial development, and has reached its peak of production in every territory before that territory has become fully peopled and developed intensively agriculturally and industrially. That has been the history of most of the forest regions of the country. The lumber industry has been self-annihilating. But need it be so? Certainly not, when so much of the virgin forest land is suited primarily for the production of timber crops as is the case in the Western forest regions. It is interesting to speculate, therefore, as to whether the history of the Central Hardwood Region, of the Lake States Pinery, and of the Southern pineries is to be repeated in the Douglas fir region of the Pacific Northwest.

The forests of Western Oregon and Washington contain the largest reservoirs of virgin timber left in the United States; and a large proportion of the lumber used by the country comes from this region. Washington has, since 1905, held foremost place among the States in quantity of lumber produced; Oregon now ranks third in production, but first in volume of standing timber, and it will not be long before the increasing annual cut will place her at the head, or next the head, of timber-producing States.

PRIMEVAL DOUGLAS FIR FOREST IN THE FOOTHILLS OF MOUNT ST. HELENS, SOUTHWESTERN WASHINGTON

Fifty years ago there were twenty million acres of such dense virgin forest, extending in an almost unbroken strip from British Columbia to Southern Oregon and from an altitude of 3,000 feet on the Cascade Range to the Pacific Ocean.

The volume of standing timber in these two States is enormous; from the mountain tops the expanses of solid virgin timber appear limitless, and expressed in board feet the amount seems inexhaustible. But logging on the watersheds available to transportation is progressing with alarming rapidity, and it is high time that these States decide whether their timberlands are to be "mined" of their virgin resources and abandoned as unproductive,

or whether their forests are to be cut with a thought for the future, the land kept in a timber-producing condition, and the important lumber industry perpetuated indefinitely. Action should be taken accordingly.

What is the forest problem of the Douglas fir region of Oregon and Washington, how may it be solved, and what is being done to solve it?

A half-century ago there was a practically unbroken stretch of forest, either old or young, from timberline on the Cascade Range to the Pacific Ocean and from British Columbia to Southern Oregon. A few meadows and "prairies," especially in Oregon, and some rock barrens made the only breaks in the natural forest cover. Within the altitudinal zone suitable for commercial tree growth, i. e., below an altitude averaging about 3,000 feet, Douglas fir was the principal tree, and so this forest

A 54-YEAR-OLD "SECOND-GROWTH" FOREST OF DOUGLAS FIR

This is in Western Oregon, which originated from seed stored in the ground after a disastrous forest fire that killed the virgin timber. This view is taken on a sample plot upon which all the tagged trees are periodically measured and which by actual record is growing at the rate of 1,259 board feet per acre per year.

region is called the Douglas fir region. Upon the coming of the white man this region was by no means all covered with heavy virgin stands of old timber, for there is every indication that fires had played havoc in this country from time immemorial. Where these fires had run, second growth stands had nearly always replaced the old timber and consequently every gradation from the very young stands of seedlings to the old timber was found. In some places, particularly on the high mountains and adjacent to the valleys inhabited by Indians, too oft-repeated fires had annihilated the forest, and brush or grass had taken its place. Many of the stands of old timber had been so scourged with fire and yet not killed broadcast that they carried but a portion of the merchantable timber of a normal, well-protected forest. So it is that in the region as a whole—considering second-growth stands after burns, fire-scourged stands and all—the average stand per acre is only about 30,000 feet, whereas it should have been 100,000 feet per acre.

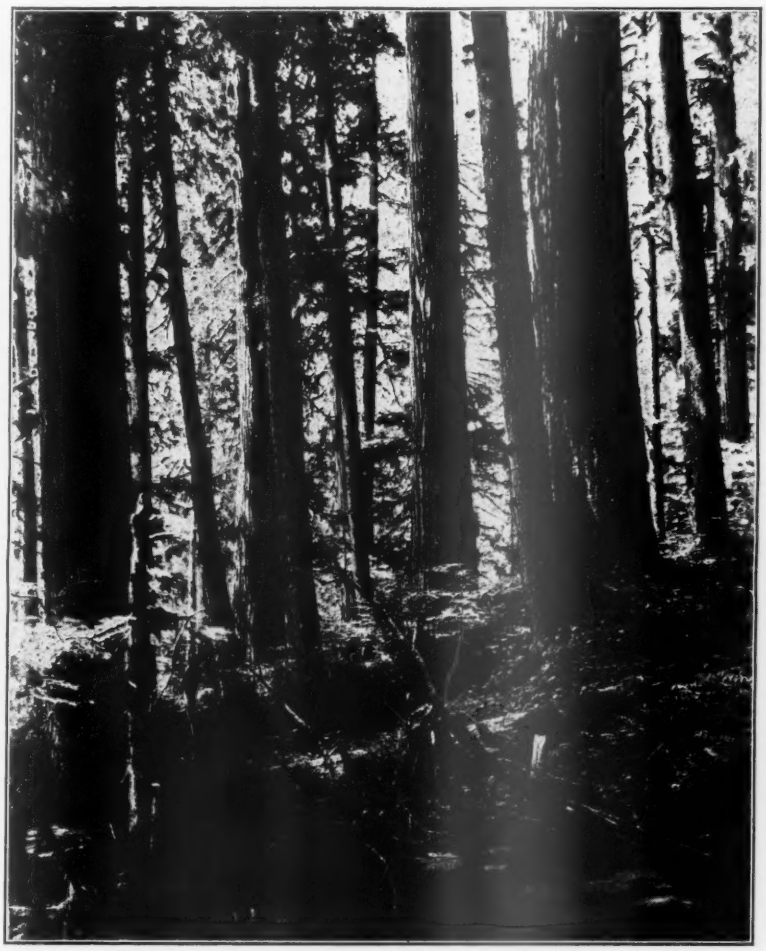
The following tabulation gives the best available estimates, some of them taken from scanty data, of the amount of merchantable timber and of the acreage of commercial virgin timber and of cut-over land within the Douglas fir region of Western Oregon and Washington, in both public and private ownership:

| | Western Oregon. | Western Washington. | Total Douglas Fir Region. |
|---|---|---|---|
| | BILLION FEET, B. M. | | |
| Merchantable Timber— | | | |
| National forests..... | 85 | 65 | |
| Private, State and Indian Reservation.... | 260 | 150 | |
| | | | 560 |
| | ACRES. | | |
| Virgin Timber Land— | | | |
| National forests..... | 3,000,000 | 2,500,000 | |
| Private, State and Indian Reservation.... | 7,000,000 | 4,500,000 | |
| | | | 17,000,000 |
| | ACRES. | | |
| Cut-Over, Not Cultivated— | | | |
| National forests..... | 10,000 | 25,000 | |
| Private, State and Indian Reservation.... | 1,200,000 | 2,500,000 | |
| | | | 3,735,000 |

The lumber industry did not develop to large proportions in the Douglas fir region until about 20 years ago. The annual cut of logs in Washington is now about 6,000,000,000 feet and in Oregon about 1,500,000,000 feet annually. This means the cutting over of nearly 200,000 acres annually in the western part of these two States. There is every indication that the industry has not reached its zenith of production, and that with the exhaustion of the Southern pine forests and the increase in the export business the Douglas fir forests are to be drawn upon even more heavily.

The customary logging practice—and the only one practically feasible with these large trees—is to cut clean and log the timber off with steam donkey engines. This method is not inimical to good forestry practice, for the silvical characteristics of Douglas fir and most of its associated species are such as to demand clean cutting. After the area is logged it is burned broadcast, often by accident, if not by intent, for the State laws require the burning of slash during the safe seasons to remove its menace to surrounding timber during the summer. This is well enough from the forester's viewpoint, provided the burning is done at the right season, for it has been found that when a Douglas fir slashing is burned over once immediately after logging there is almost sure to follow a dense stand of seedlings. The origin of this new crop has been somewhat of a mystery until the

investigations of the Wind River Forest Experiment Station brought to light the fact that the seed from the virgin forest lies dormant in the duff and humus of the forest floor, perhaps for several years; some of it escapes damage by the slash fire after logging and germinates the first spring thereafter. This accounts for the hillsides of magnificent reproduction on logged off lands and burns, where there are no seed trees which might have begotten such reproduction. Were these areas immune from fire after the first slash burning there would be no need for concern as to the future productivity of the Douglas fir lands of the Pacific Northwest. A second crop would be assured. But these logged off lands, even though once burned over by a terrifically hot broadcast slash fire, are far from immune from subsequent fires. The coarser debris is not consumed by the first fire, dry fern and weeds soon supply the kindling, and only a spark is necessary to start a fire which would run over the area a second or a third time. Sometimes an area burns over twice in one season. If all the seed stored in the ground germinates after the first fire, the second fire kills the seedlings, and if there is no source of additional seed in the near vicinity the chances for a second crop by natural agencies are very small. Sometimes the second fire is not severe and runs over the area in a crazy-quilt fashion, leaving islands of reproduction here and there. The irregular distribution of trees in many of the old forests is due to this process of partial burning of the first reproduction.



A TYPICAL CLOSE-UP VIEW OF A DOUGLAS FIR FOREST

This is in Western Washington, where the mature trees average 4 feet in diameter and 225 feet high. Such stands are now the scene of hundreds of logging operations, which are reducing to stump land about 200,000 acres of private land annually, without making any conscious effort to renew the forest growth.

This is the history to date of the logged-off lands of the Douglas fir region: A slash fire immediately following clean cutting; a crop of seedlings coming from seed stored in the forest floor; and then a second and a third and possibly even more fires which destroy what Nature sowed and which leave the area a waste of fern, blackberries, fireweed and brush, upon which Douglas fir will become established only by the slow process of migration or by artificial means. Sometimes, by a turn of fortune, an area escapes the second fire and the initial crop of seedlings survives and in 20 or 25 years reaches an age when, because of its dense shade, it is somewhat resistant to fire and gives promise of reaching maturity. Sometimes when the cutting has not been absolutely clean, defective cull trees are left and these act as seed distributors and restock the area in the event of a second fire.

There are many thousands of acres of logged-off lands in this Pacific Northwest covered by as pretty a stand of Douglas fir saplings as the forester could wish for. There are more which are devoid of adequate tree growth of any kind. The difference is due, on the privately owned lands, to chance, not to any conscous effort to secure a new crop. It is not unnatural that it should be so. The supply of virgin timber seemed inexhaustible and still seems so to the majority of people in Oregon and Washington, as it did in the Lake States and the Southern pineries 50 years ago; the fire demon seemed invincible, especially on the open cut-over lands. The timber land owner's chief concern was to protect the green timber; he had many troubles, and why should he concern himself with providing for a second crop when he had more timber than he could cut in 30 years, could afford to pay taxes and interest on and protect from fire. Meanwhile the public, which should be vitally interested in the continued productivity of the forest lands of the

commonwealth sat by and did nothing either to enforce, to make easy, or to help along the practice of forestry on private lands, not even lending moral support to the solution of the cut-over land problem.

One of the large factors in retarding a conscious effort to secure the reforestation of logged-off lands is the question of the future use of these lands. If they are useful for agriculture or pasturage, repeated fires are a benefit. The early logging was at the lower elevations on the bottoms and low, rolling hills, close to the settlements bordering Puget Sound and the Columbia River and its tributaries. The land was all suitable for agriculture and the lumberman had hopes of disposing of it for that purpose. As the logging has progressed farther back into the rougher mountain country the hope that this cut-over land might be sold to settlers at a profitable figure has persisted. This expectation of selling all kinds of logged-off land for farms—often stimulated by the unscrupulous land sharks—has postponed the initiation of action looking toward the practice of forestry on the ultimate forest lands. As a matter of fact, much of the land which is now being logged over is so rough or rocky that it is perfectly apparent that it has no agricultural possibilities and that it ought to continue to produce forest crops. Accurate figures as to the acreage logged over in the Douglas fir region of the two States are not available, but it is estimated that there are about 2,500,000 acres in Washington and 1,200,000 acres in Oregon cut over and not cleared. Added to these are many hundreds of thousands of acres of burns in a denuded condition. Of this perhaps a half is farm land—either plow land, pasturage, or incidental wood lots; the remainder is best suited to forest growth. Besides the cut-over land there remains in private ownership some 11,500,000 acres of virgin timberland (exclusive of burns and sparsely timbered areas). A larger proportion of this is ultimate forest land than of cut-over area. A conservative estimate of the ultimate forest land in the Douglas fir region of Oregon and Washington in private ownership—both cut-over, timbered and denuded burns—is 10,250,000 acres. Added to this there is a great acreage within the National Forests and a lesser amount in State ownership and in Indian Reservation. The area of commercial Douglas fir timberland in Federal ownership within the National Forests of Oregon and Washington is considered to be 5,000,000 acres, practically all of which is ultimate forest land. Altogether, then, there are, in round numbers, 16,000,000 acres of potentially productive permanent timberland in Western Oregon and Washington. This acreage is capable of producing 9,000,000,000 board feet per year, assuming an average growth rate of from 900 board feet per acre per year on the best sites to 450 board feet on the poorer sites. This potential capacity of these lands is in excess of the present lumber cut of the region. In other words, the great lumber industry of the Pacific Northwest might continue on its present basis *if*, and this is the "if" which must be settled by the people of the Northwest and the country right promptly, *if* intelligent and strenuous action is taken to effect the reforestation by protection of all ultimate forest lands as rapidly as they are cut over.

A HILLSIDE OF DOUGLAS FIR REPRODUCTION ON THE COLUMBIA NATIONAL FOREST, WASHINGTON

This was logged over in 1909 according to the dictates of good forestry, the slash burned the same year and subsequent fires kept out. Most of the reproduction came from seed stored in the ground; one of the seed trees left as an added assurance of natural reforestation is shown in the background.

If present methods continue, by which cut-over land is left at the mercy of fire and no conscious effort made to keep it productive, but a fraction of the potential increment will be realized. It is now only chance areas which become satisfactorily reforested after logging, and then it is due to the indomitable reproductive vigor of Douglas fir and hemlock and a fortunate escape from fire. The rest are left by the logger thoroughly denuded, scourged by repeated fires, and likely to remain unproductive for many years.

The securing of reforestation after logging in the Douglas fir region is not an insuperable task; it is simple in principle and requires no radical modification of present logging practice. Nature will do it alone, if she is given a chance and freedom from man-caused fires. The practice of forestry is here 99 per cent fire protection. As stated above, when the virgin forest is cut the seed is

in the ground. If the slash is burned immediately after logging and before the succeeding germinating season, which is the month of May, reproduction is almost sure to result. Then if the area is protected from subsequent fires, satisfactory reforestation is assured. Falling of the "snags" or dead trees is a most desirable fire-protective measure, for these in the event of accidental fire become torches which throw sparks high in the air and are the greatest hindrance to the suppression of a fire. If the burning of the slash is delayed too long after the logging, the reproduction resulting in the interim from the seed stored in the forest floor will be killed and reforestation will take place only from chance seed trees or from adjacent green timber, if any. For a further assurance of natural reproduction and as a precaution against accidental fires it is well to leave occasional seed trees—one or two to the acre should suffice. This is not a difficult or expensive provision for the logger to make, for in nearly all Douglas fir stands are misshapen and "conky" Douglas firs, which are so defective as to be hardly worth logging, yet are perfectly good seed trees.

A SECOND-GROWTH FOREST OF DOUGLAS FIR

This is typical of many in Western Washington and Oregon and is nearing merchantable age. Under proper methods of logging and fire protection the Douglas fir lands now being cut over can be made to produce successive crops of timber as fine as this.

The silvicultural prescription for the practice of forestry in Douglas fir region then condenses to this:

1. Log clean as at present.
2. Leave occasional defective trees as seeders, whenever such are available.
3. Fall the snags, which are a fire menace, at the time of logging.
4. Burn the slashing broadcast the first spring or fall after logging.
5. Keep subsequent fires out of the areas once burned.

The last provision is the one difficult of accomplishment and the one that costs money, but it means the difference between denuded wastes and richly productive second growth timber.

The reader may here ask what is being done to put these simple principles into practice, why is more not being done and what constructive action must be taken to put them into effect. It must be acknowledged that practically nothing in the way of a conscious effort to secure the reforestation of the cut-over lands is being done on private lands. There have been one or two sporadic attempts to practice forestry which were abandoned not because they were not successful but because the companies were more concerned with other problems of their business. On the National Forests the cutting of timber is, of course, done according to the above silvicultural principles, and has been in the main fruitful of good results. The still imperfect control of the fire menace is the only factor which has prevented ideal results.

More progress has not been made in the practice of forestry largely for one very good reason—the timberland owner is not interested in a long time proposition under existing conditions. You can prove on paper to him that cut-over land if cared for and protected will yield a crop in eighty or a hundred years which might net a fair rate of interest, but he is not in a mood to engage in any such long-term and uncertain investment. He is, at present, embarrassed by a surfeit of virgin timber which is expensive to carry. His business is gauged on a quicker turn over; his capital is needed for present operating expenses.

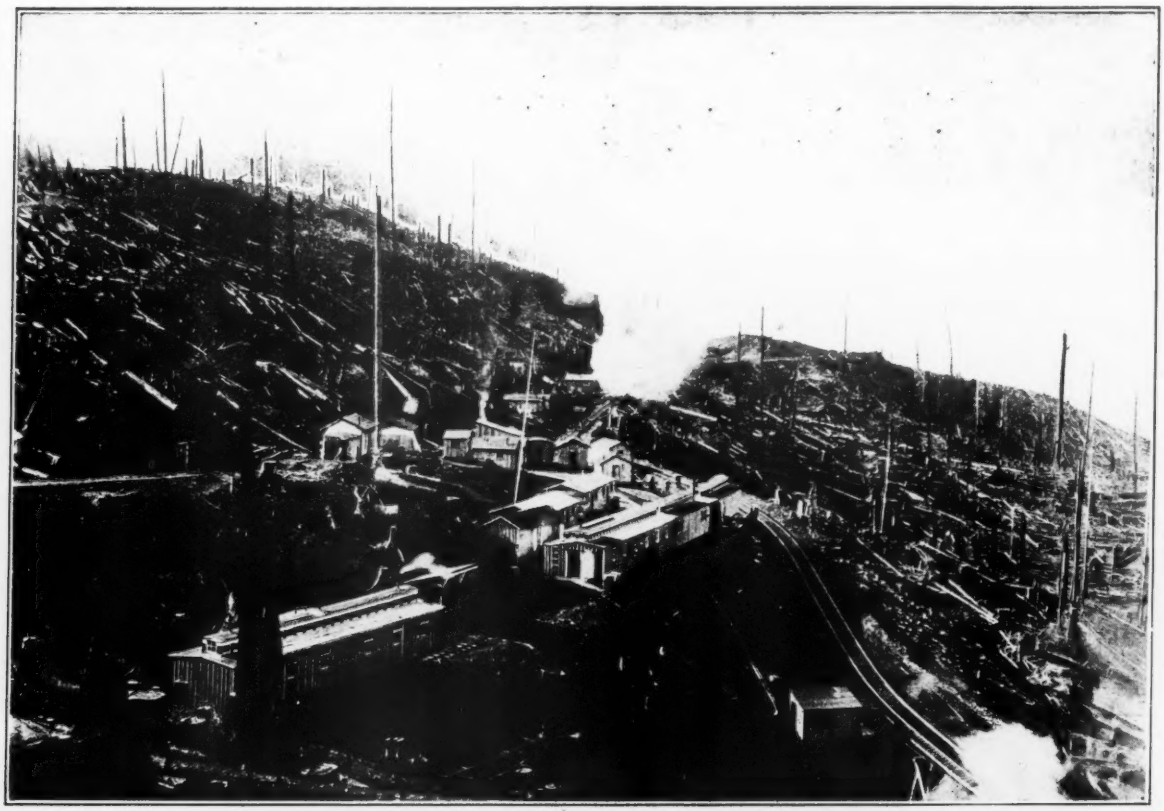
But even were he interested in growing a second crop there are certain economic obstacles which inhibit the practice of forestry on private lands, and these must be removed before the timberland owner will engage in

it. These obstacles are the insecurity of the timber crop from fire and the existing system of taxing both land and the growing crop annually. There must be a more effective State-wide protection against fire before the individual owner wishes to put a large investment in cut-over land reforestation. In spite of most efficient fire protective associations of timberland owners caring for virgin timber, the private owner cannot be sure that his land will have perfect protection. There are too many hazards from adjacent lands not now covered by association, State, or Federal patrol—chiefly the private cut-over areas, which are the "no man's land" of fire protection. It then becomes a public function to give each owner security by enforcement of the fire preventive laws and by a radical extension of the public and private co-operative fire protection system which will give reasonable safety to all lands both cut-over and timbered. Tax reform has long been agitated, but slow in coming. It is not the major obstacle to the practice of forestry, but under the present system a long time forest investment could not be very profitable.

The Pacific Northwest is fortunate in having among the leaders in the lumber industry men who are forward-looking, open-minded, and public-spirited. They know the history of other forest regions and appreciate the problem that lies in this Douglas fir region. They are not unconscious of the responsibility that is theirs to prevent the self-annihilation of the lumber industry and the denudation of great areas of potentially productive land. They co-operate well with public agencies and have an open mind for what the forester can tell them. More and more they are realizing that something must be done and are talking about it a good deal, but so far doing little.

The solution of the cut-over land problem which they almost unanimously propose is public ownership. They claim in effect that long term practice of forestry on extensive forest areas such as those in the western mountains is not an enterprise for a lumber company, but that it must be done, and that the public (either Federal or State government) is, therefore, the only agency to do it. It is not that they are shirking their responsibilities in the matter—"passing the buck" to the Government—but rather that as practical men they cannot see over the obstacles which stand in the way of private capital engaging profitably in forestry. Whether these obstacles can be lowered and sentiment changed is the task for the friends of the lumber industry and conservation to find out.

Undoubtedly the hope of the lumberman will in part be accomplished and some cut-over land added to the existing National Forest and thereby put under forest management, but perhaps too late for the best silvicultural results. It is, probably, wise public policy and good economics that there should be a larger area of publicly owned forests in the western mountains than at present. The boundaries of the National Forests should be extended to round out suitable units for administration. This will be accomplished if Congress listens to the demands of the local public, by exchanges of land for stumpage



THE RESULT OF "TIMBER MINING" IN THE DOUGLAS FIR REGION, WHERE NO EFFORT IS MADE TO SECURE A NEW CROP
On such areas repeated fires, together with the absence of seed trees, mean that the land will remain permanently barren and unproductive.

and perhaps by direct purchase. The States are now in process of consolidating their present holdings into blocks, which, it is sincerely hoped and expected, will be managed for sustained yield. It is likely, though as yet not proposed, that there will be an enlargement of the areas of State forests to supplement the Federal forests.

But the solution of the forest problem of the Douglas fir region is not wholly the acquisition by the public of cut-over land. It is not desirable, I should say, that the public own the entire ultimate forest area; and it is extremely improbable that it will acquire any additional acreage before the process of denudation has been completed. Meanwhile the virgin forest will be stripped off without regard for sustained yield of watersheds, the perpetuation of regional industries or the continued productivity of the cut-over lands. Something has got to be done by the private owners to keep their lands productive. The ultimate forest lands of Oregon and Washington are not going to bear their full measure of another crop unless the timberland owner practices better forestry on his own lands than he is doing now. We might as well take conditions as they are and understand plainly that the solution of the problem does not lie wholly in public ownership, and every effort should be made to encourage the private owner to take the responsibility of caring for his lands according to correct silvicultural principles. No program to this end has been agreed upon. The subject is very much in agitation but rather overshadowed at present in the lumberman's mind by income tax problems, car shortage, and the like. It is well that it is at least in agitation and some day soon it must crystallize into a program of legislation and co-operative action between timberland owners, the State and the Federal Government. Just what this program will be or should be it is premature to say, because sentiment has not been shaken down as yet. But there are certain prerequisites to progress. These may be briefly stated:

AN EXCELLENT STAND OF 10-YEAR-OLD DOUGLAS FIR SEEDLINGS

This is the result of a conscious effort to secure a new crop of timber after logging on the Columbia National Forest, Washington. The area was cut over in 1909, the slash burned immediately thereafter, and effective fire protection given since then.

(a) A public classification of the timbered and cut-over lands of the region to determine what are agricultural and what should be dedicated to permanent forest production.

(b) Tax reform, which will remove the current burden of carrying immature forests.

(c) Stricter enforcement of the present good forest fire laws, so that property may be less subject to the menace of fire from sources outside the control of the owner.

(d) Additional financial appropriation by the States and Federal Government to promote forestry practice, recognizing that it is very much to the public interest, not only of the commonwealth but of the whole nation, that these cut-over lands be kept productive and that without governmental aid they will lie unproductive.

(e) Co-operative assistance from the appropriations proposed above to private owners who agree to manage, according to a certain standard, lands that have been classified as permanent forest ground. This assistance would embrace technical advice, the approval of working plans by a State or Federal forester, and certain phases of actual fire protection and suppression.

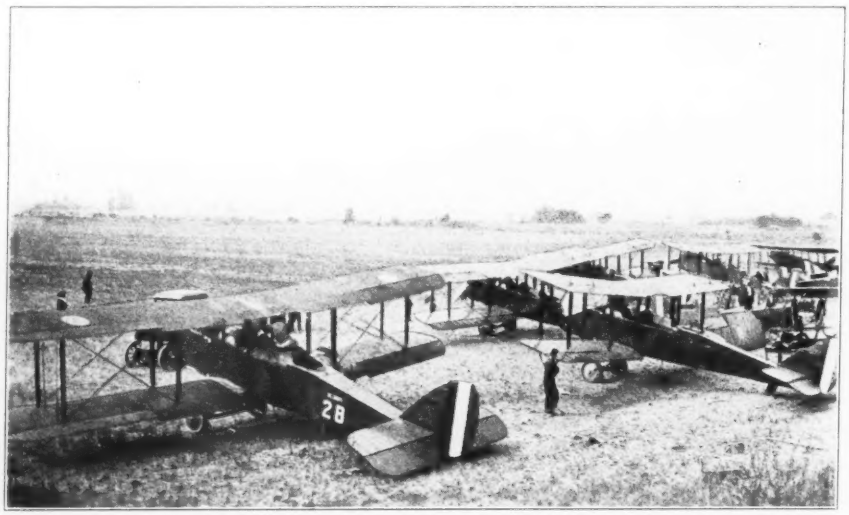
Were these five measures taken to remove the obstacles to the practice of forestry and put it on a stable basis profitable to the individual or corporate owner, there is no doubt but that the continued productivity of most of the cut-over lands of the Douglas fir region would be assured. With the enhancement of stumpage values that are sure to obtain before the next crop is cut and with the exceedingly favorable soil and climatic conditions of the Douglas fir region and the unparalleled rapidity of growth and vigor of this tree, forestry should pay here, if anywhere outside of a woodlot region. It will pay the public to adopt such measures, so that the owner will do what he would not do without them; and it will cost the public dearly in generations to come if something is not done and done soon to forestall the rendering unproductive of the immense stretches of mountainous timber lands of the Pacific Northwest.

# AIRPLANE PATROL OF THE FORESTS

## BY F. A. ELLIOTT, STATE FORESTER OF OREGON

IT may be safely said that the latest development in forestry is the use of airplanes in the patrol of Oregon's timber resources for the detection of forest fires.

Experiments along this line were carried on in Oregon last summer by the Air Service branch of the War Department, working in co-operation with the United States Forest Service and the Oregon State Board of Forestry. Last season's work may be classed as an experiment by the different services to determine the advisability of maintaining such a patrol from year to year. Would airplane patrol prove to be the more economic and effective, eventually replacing the patrol and lookout system now employed for forest fire detection and suppression? These and many other questions were in the minds of the men charged with the protection of Oregon's timber when the planes were first introduced. The Air Service had available planes and personnel at their disposal. These pilots, mechanics and planes must be kept in action, and the Air Service was anxious to determine the possibility of performing a real and valuable service in conjunction with their regulations, which provide that each pilot spend a certain amount of time in the air. The men on airplane patrol in Oregon last season are highly enthusiastic over the experiments and eager to become efficient in this new line of work, while the Forestry officials are extremely optimistic over the possibilities of organizing an efficient patrol system for the coming year.




SALEM AIRPLANE PATROL BASE, SHOWING DE HAVILAND TYPE PLANES

Meetings of representatives from the Air Service, State, Federal and private forest protective organizations are being held and plans formulated for 1920. It is very probable that the War Department will give further assistance next season, and that a system of airplane patrol will cover Oregon, California, Idaho, Montana and Washington. Such a patrol will disregard all State and National Forest boundaries and will conform to the general topography and character of the forest cover throughout the five States. California and Oregon were the only States to receive aid from the War Department in airplane patrol during 1919.

For Oregon alone, one complete observation squadron will be required to sustain a daily patrol of the 28,000,000 acres of timber, brush and cut-over land which constitute a fire risk. This squadron will probably consist of 18 planes, most probably of the DeHaviland type, 180 men, from 30 to 40 officers, carrier pigeon lofts, and will include a photographic and radio section.

Besides maintaining a daily patrol during the fire season, it is planned to photograph the entire forested area. With the special aerial photographic appliances now in use by the Army, it is estimated by Army officials that this work may be accomplished in practically three weeks' time.

Should the plan for the combined patrol of the five States be approved by the Air Service, primary control stations will be established at Eugene, Oregon; Camp Lewis, Washington; Mather Field, near Sacramento, California, and one other in Idaho or Montana not yet selected. The Oregon sub-bases will be located at Portland, Salem, Eugene, Roseburg, Medford, Klamath Falls, Prineville, Marshfield and Baker. To accommodate the large DeHaviland ships, the landing fields must be at least 2,000 by 1,000 feet, free from obstructions, such as trees, telephone lines, etc., and located on a level or fairly even slope of sod or firm soil. Several such fields have already been provided through the efforts of local Commercial or Aero Clubs and by public-spirited citizens, and are located at Portland, Salem, Eugene, Roseburg and Medford. The advisability of going to any great expense in providing emergency landing fields along the patrol routes in the mountainous regions is not considered practical by the Air Service officials, since they state that such fields are apparently never located near where trouble occurs.

The mechanical success of the planes is beyond question when the following figures are considered regarding the distance covered by the Oregon patrol in 1919. The

first patrol startd August 2, and continud until August 22, during which time seven Curtis type planes were used—four ships making two two-hour trips each day, flying at an average speed of 60 miles an hour and making a total distance of 20,160 miles during the 21 uninterrupted flying days. August 23 the Curtis planes were replaced by the larger DeHaviland type, as they can remain in the air nearly twice as long. This type was found to be the more efficient and continued the patrol work until October 7, when the fall rains and cool nights made further patrol unnecessary for the season. The DeHaviland planes are American made and contain a 400-horsepower Liberty motor, and are capable of traveling at the rate of 120 miles an hour. Although a more difficult plane to handle than the Curtis type, they have a much greater gas and oil carrying capacity and can safely remain for a period of four hours in the air.

CRATER LAKE FROM THE AIR. IN THE DISTANCE MAY BE SEEN DIAMOND LAKE, MT. THIELSEN, MT. BAILEY AND THE SISTERS

During the 35 actual patrol days by these five new ships—two flying six hours each day at an average speed of 95 miles per hour—they covered a distance of 39,900 miles. The combined distance flown by the Curtis and DeHaviland planes during the 56 patrol days amounted to approximately 60,060 miles, or more than twice the distance around the earth. This distance was traversed with only six forced landings; three due to inclement weather, and resulting in one wrecked plane. The other three were caused by motor trouble, resulting in the loss of one officer and the total loss of one ship. The entire operating expense was borne by the Air Service. The State and Federal Forest Service arranged the plan of patrol and gave the pilots and observers the benefit of their knowledge in fire detection and suppression gained through years of experience. They also provided landing fields, arranged for gasoline and guards for planes at substations, provided transportation for the men to and from the fields, and co-operated with the Air Service in every possible way.

AN AVIATOR'S "CLOSE-UP" OF MT. HOOD FROM THE SOUTHEAST. ELEVATION 11,225 FEET

The area of effective visability depends somewhat upon the atmospheric conditions and the altitude of the plane. At a height of 10,000 feet, under fair observation conditions, a very small fire may be easily picked up at a distance of 30 miles.

It is during smoky weather that the airplane patrol is much more advantageous than the lookout system. Neither smoke nor a difference of several thousand feet in altitude hinders the visability as much as one would suspect. With the lookout system there is rearly always a section of the country back of the ridges which cannot be seen; with airplane all regions are equally visible. The airplane is not only effective for locating new fires, but, as the past season demonstrated, is extremely valuable in reporting progress on large fires or in exactly locating a group or series of small scattered ones. Experience has shown that a trained observer, after a reconnaissance from the air, can gain more useful information

about the character of a large fire than can a man on the ground in a heavily timbered area. Controlled fires can be covered each day to see that they do not break out anew.

At present it is not deemed advisable to reduce the regular patrol and lookout personnel; however, these men may be used more advantageously and, instead of being on patrol duty, may be bunched on improvement and construction work; each working crew to be provided with a telephone set and fire fighting equipment so that upon report of a fire they may proceed without loss of time as an organized fire fighting crew.

The success of this new patrol depends principally upon the accuracy of the observer in locating the fire and the rapidity with which he reports the fire to the district ranger or warden in whose district the fire is located.

The accuracy with which a fire can be located depends upon the experience of the observer and the correctness of the maps with which he is provided. The State Forester has provided complete cover maps of Oregon, showing the timberlands, old burns, brush, cut-over or farm lands and the location of all principal roads, streams, cities and railroads.

A SOUTH VIEW OF MT. HOOD FROM THE AIR

Next season the Air Service officials plan to start the patrol at least one month before the beginning of the fire season in order that the pilots and observers may familiarize themselves with their duties and the country over which they will maintain the patrol. During this instruction period it is planned to photograph the forested regions of the State. These photographs will be assembled in map form and be used in connection with other maps for the location of fires.

The lapse of time between the discovery of a forest fire and the action taken for its suppression is a most decided factor in any fire-fighting plan.

Army planes equipped with wireless telephone sets will overcome this need of rapid communication. The United States Forest Service has been successfully experimenting with wireless telephones on Mount Hood and other lookout points. It is expected that by next season such progress will have been made in the experiments as to make their use practical. However, should it be found impossible to obtain the necessary wireless equipment, message dropping from the planes can be successfully developed.

A panel system of identification will be worked out by which each district ranger headquarters and lookout point will be given an identification mark. A black and white square 30 by 30 feet will be located near the district ranger's headquarters and on all prominent lookout points. A corresponding legend will be indicated on the observer's map, so that he may pick up his exact location within any 20-mile radius and can dive down to within 50 or 100 feet of the ranger's headquarters and drop his plat showing the location of the fire, together with any comments or data regarding its action which would prove useful to the ranger.

Message-dropping cans, with a screw-top lid and to which a three-foot red cloth streamer is attached, are available by the War Department. A clearing of at least an acre may be found near all ranger stations and observers can easily hit this sized target. The noise of the approaching plane will put the ranger on the watch for messages.

The observers may be regular Army men trained for this type of work, or they may be experienced fire fighters employed by the Government or State; or at least such men will be often used in making a reconnaisance of large fires. Pilots and observers will carry food and fire-arms so that they may be provided for in case it becomes necessary to make a forced landing in an uninhabited region.

Carrier pigeons will also be used as a means of communication. Experiments in this line were carried on last year and the Signal Corps has detailed an officer and three men to raise and care for the 48 carriers which are now at Eugene. At least 11 lofts, scattered through the five States, were to be started about January 1, so as to have the homers trained for next year's work. Great care is necessary for the proper care and feeding of these birds. This new line of work is not only extremely interesting, but it is believed that the proper organization of an airplane patrol system will result in the saving of thousands of dollars lost each year through the burning of Oregon's timber. Many new ideas of forest fire detection and suppression may be expected in connection with this new system.

# GREAT TEACHER OF FORESTRY RETIRES

BY FILIBERT ROTH

DEAN OF FORESTRY, UNIVERSITY OF MICHIGAN

PROFESSOR B. E. FERNOW, having passed the retiring age, has resigned as Dean of the Forest School of Toronto University with the title of Professor Emeritus. The Nestor of foresters in America has thus relinquished active service. Our masterbuilder in forestry has laid down his pencil and square.

For over forty years Fernow has worked uninterruptedly to bring forestry into our American woods; to further the science of forestry; to develop right legislation with regard to forestry as a basic industry, and last, but not least, to prepare men for a profession whose task is to build up and care for the forests of North America.

DR. BERNARD EDWARD FERNOW

With thorough schooling; with forest training at Hanover-Munden, under the famous Heyer and others; with experience as regular forester, Fernow came to this country in 1876, a young man of fine presence, an athlete, scholar, enthusiast; able to see things clearly and in large lines; able to state the case convincingly and able to pick out the things to do, the things of importance and of real value to the great movement in forestry. During the years 1878-1885, he had charge of 15,000 acres of hardwoods in Pennsylvania, supplying the charcoal-iron works of Cooper-Hewitt Company, and other furnaces. While thus engaged in one of the pioneer efforts in the practice of forestry in the United States he found time to write on forestry for *Birkenbine's Journal of Charcoal Iron Workers*. During the early years of this period, being located in New York, he took an active part in starting the forestry movement in that State, and in 1885 formulated for Senator Lowe the legislation which established the forest reserve in the Adirondacks and the State Forestry Commission, embodying in that legislation also the first forest fire warden organization.

In 1882 he assisted in the forming of the American Forestry Association at Cincinnati and Montreal, and for fifteen years acted as Secretary and Chairman of the Executive Committee of this Association. The Association being short of funds in the earlier years he published, as a private venture, several bulletins on forestry, and from 1885 to 1898 he was editor of the Proceedings of the Forestry Association, and of its journal, under the title *The Forester*. To this task of secretary-chairman-editor he devoted much time and effort, directing the work of the Association along definite, well-planned lines, and thus enabling the Association, in spite of its insignificant numerical and financial strength, and in spite of its composition, in which timber owners and representatives of the wood-using industries were almost lacking, to accomplish most astonishing results. The most notable of these was the greatest piece of forest legislation so far adopted in our country, the law of 1891, authorizing the President of the United States to establish National Forest Reserves.

This great act which led to the creation of our present-day "National Forests," and saved to our people an area of forests greater than the combined forest areas of France, Germany and Austria was primarily due to the work of three men whose names should and will live in the history of our nation: Dr. Fernow, Edward A. Bowers, at one time Assistant Commissioner of the Land Office, and Secretary of the Interior Noble, one of our real statesmen who appreciated the importance of the enterprise and was convinced by the clear and concise statement made by Dr. Fernow as the spokesman of a little group of members of the American Forestry Association.

Dr. Fernow's great work for the nation really began in 1886, when he accepted the position of organizer and director of the forestry work of the government in the Department of Agriculture, a position which he occupied until 1898. At that time lumbering was in its glory; there

was no thought of timber exhaustion; Michigan white pine went clear to Texas; Sargent's "Tenth Census" figures were disputed; anyone considering them seriously was a "denudatic" (harmless maniac) in the parlance of the practical experts. There was no use in asking a timber owner to engage in forestry when all his competitors were exploiting on the basis of "cheap logs," at least cost and with the invariable result of utter forest devastation. All this Fernow saw as clearly as anyone. His keen sense of justice, his love for plain truth and accuracy did not allow him to find fault with the men of the industry; but neither could he compromise the sound principles of forestry. To him forestry never was and never could be lumbering; his knowledge of forestry was too thorough, his ideals too firmly implanted, and his dislike of all bill poster work was instinctive. To a smaller man the task of starting a useful Forestry Division would have seemed hopeless. Not so with Fernow. With a rare grasp of the situation, he started work at once and along six important and useful lines of action: the spread of forestry information among the people; forest legislation by States and nation; gathering reliable information regarding our trees and forests; experiments to determine the technical properties of our principal species of timber; the stimulating of tree planting on the plains, and finally the education of college students in forestry as a science and industry. With unusual powers for work, almost single-handed, and under the most discouraging conditions of money and equipment, he started this great work.

His first act (1887) was the introduction of the "Hale" bill, providing for National Forest Reserves and their administration; this effort was followed up until it succeeded in 1891. Since no provision for an administration of the National Forests was made in 1891, more effort was required to provide for such; the "Paddock" bill in the Senate in 1892, and the "McRae" bill in the House in 1894, did not succeed, although the latter passed both Houses and failed to become law by mere accident. It was not until 1897 that a definite administration was provided and thus the National Forests actually established as a working enterprise.

During the twelve years at Washington Fernow kept in close touch with the forestry work in the various states, and there was little of state forest legislation passed during this time in which his opinion was not consulted. In spite of the most meager appropriations he succeeded in making a good start in forest and timber research; he secured the co-operation of many prominent men of science; and the numerous bulletins and circulars, including monographs on White Pine, the Southern Timber Pines; results of tests and studies in Timber Physics, the first complete discussion of the metal railway tie as a possible substitute; studies on timber impregnation, and other subjects, all of immediate value in wood utilization, are evidence today of the painstaking work of the guiding spirit which directed them and edited their results for publication. An appropriation for rain-making, turned over to his division, was promptly refused by Fernow. Instead, a scientific inquiry into existing information with discussions by the heads of the Weather Bureau and other competent authorities was published as "Forest Influences," the first of its kind in this country.

Throughout the twelve years in the Department, he never ceased to write articles and addresses, and to go out to deliver lectures wherever opportunity offered. It was in these years that the larger part of his over 200 articles and addresses, over 20 circulars and over 30 bulletins and reports were prepared or edited. The first series of twelve technical lectures to a body of students was delivered at Massachusetts Agricultural College in 1887; others followed at Nebraska University, Colorado, Wisconsin and California. In 1898 Fernow was called to Cornell to organize the first forestry school in the New World. It was a state school, maintained by regular appropriations by the legislature, and the state provided a school forest of 30,000 acres in the Adirondacks. Here he inaugurated the beginnings of professional education. The school grew rapidly until in 1903 it was discontinued by a veto of the governor, owing to misunderstandings developed in connection, not with the school at all, but with the tract in the Adirondacks. While at Cornell Fernow published his "Economics of Forestry;" delivered a series of lectures at Queen's University, at Kingston, Ontario, which were published in French in book form as "La Foret," by the Department of Lands of Quebec, and in English by the Department of Lands of Ontario as well as by the University. In addition he started the *Forestry Quarterly,* now the *Journal of Forestry,* the only technical forestry journal in the country.

For four years (1903-1907), after leaving Cornell, Fernow worked as consulting forester; kept several timber cruisers and surveyors going summer and winter; did more forest consulting work than had ever been done by any forester in the United States; examined large properties; carried his work into Cuba, Mexico, the South and the Northeast, and demonstrated, in a way quite surprising to some of his acquaintances, his great versatility, and his capacity in business, which had long secured for him a standing among large business men, such as no forester had ever enjoyed. During these four years he continued the *Quarterly;* delivered two courses of lectures at Yale University, and started the forest school at Pennsylvania State College. In 1907 Dr. Fernow accepted an invitation to Toronto University and organized the first forest school in the Dominion, where his work was well known and where he was received by many personal friends, among these Dr. Saunders, of Ottawa, and Sir Henry Joly de Lotbiniere, of Quebec. From this school he has now resigned, with the title of Professor Emeritus, after twelve years of unquestioned success. During these twelve years he did not confine his work only to teaching at the college; he published his well known "History of Forestry," a masterpiece of its kind, covering the subject for both the Old and New World, and also "Care of Trees in Lawn, Street and

Park," a most useful book. In addition he continued the publication of the *Quarterly,* acted as editor for the *Journal,* became a member of the Conservation Commission of Canada, in which capacity he, with his colleagues, White and Howe, conducted some very important field studies, notably the "Forest Survey of Nova Scotia," and the "Survey of the Trent Watershed," both published in book form by the Commission.

Fernow, as few men have ever done, blazed trails in the wilderness; he did his work well, the trails are now traveled by many, the wilderness is opening up. New conditions of supply and demand, of industry and transportation; conditions long foreseen and foretold by the master, are now extending the trails, and expanding them into broad highways, where travel is comfortable and work does not require the self-sacrifice and special abilities of the pioneer; he led the way in forest education of our people and our foresters; he laid plans and began the great task of gathering the information on which forestry in North America must base its work; he secured the first important forest legislation for the nation and directed most of the pioneer legislation in our states; he gave us a forestry journal ranking with the best; he planted in the New World the right ideals without which forestry will never succeed in any country.

To know Fernow, the man, one must have had the privilege of seeing him in his home, on trips in the woods, on water, on the ice, with his family and friends; must have walked with him in the forest; or climbed Mt. Lafayette; have seen him in a company of scientific men, whether mining engineers or entomologists; have heard him among the foresters and economists of the world gathered at the international congress at Brussels; have heard him discuss philosophy with Dr. Ward, and more than all, have seen him seated at his piano, playing, enraptured, far away in another, gentler world.

For having enjoyed this privilege for years, the writer expresses his gratitude to his wise friend and patient teacher.

What Dr. Fernow meant to his students in college is best stated by a few, among the many.

*Walter Mulford, Professor of Forestry at the University of California:*

To those of us who have had the good fortune to have been long in Dr. Fernow's class room, there is no need to speak of what he did for us there. To the less fortunate ones we can only say that we regret their loss in not coming in contact as students with the strength and the beauty of his leadership. It is the leadership of the first great teacher of forestry in the western hemisphere.

*C. R. Pettis, State Forester of New York:*

Dr. Fernow not only "blazed the trails" in American forestry, but, through his untiring efforts, he established principles and left forest monuments which make him the foremost American forester. His wonderful knowledge and enthusiasm made him a great teacher; his individual personality is admired by all; his kind helpfulness appreciated by all with whom he came in contact, and his work something that cannot yet be fully measured, but, as time passes, will be found a basis for our silvicultural work.

*E. A. Sterling, of James D. Lacey and Company, New York, Timberbrokers:*

Each receding year emphasizes the value of the associations made and the relationships established while in college, so, in looking back to the days spent at Cornell in the pursuit of forestry knowledge, under Dr. Fernow, one of the most vivid and treasured memories is the strength of his personality and the value of his guidance and inspiration.

The scholastic things we were supposed to acquire have merged into a broad background of subsequent experience, but the personal associations gained during those years stand out more prominently and assume new importance as time goes on. The problems in forest finance and the involved theory of some old world teacher are long forgotten, but the personality of the man who patiently labored with his students to make them both foresters and men, will never be erased, nor can he wholly appreciate the helpful influence which he exerted.

So to Dr. Fernow, as Dean of the forestry profession in America, as he was Dean of Forestry at Cornell, goes the most heartfelt appreciation of his work, both as a teacher and as an educator in the much broader field which has been covered by his activities. Two decades have demonstrated the soundness of his vision in building up the foundation of a forestry profession at a time when it seemed unneeded, and of little practical application, and not only laying the foundations, but in helping rear the structure which gradually rose from it. He has exerted an influence which is appreciated not only by those fortunate enough to have been his students, but by all who think broadly and see clearly.

*Philip W. Ayers, Forester of the Society for the Protection of New Hampshire Forests:*

To have been a student under Dr. Fernow is a lifelong inspiration. Not only the breadth of his scholarship in forestry, but also his enthusiastic devotion to the subject, his belief in it, his sense of its usefulness, were all impressive. To each of us personally he was kindness itself; the hospitality of Dr. and Mrs. Fernow can never be forgotten. To both my earnest, best wishes.

*Raphael Zon, U. S. Forest Service, Chief, Forest Investigations:*

The appointment of B. E. Fernow as Professor Emeritus at the University of Toronto, and his retirement from active teaching, marks not merely a change in his private life but also an epoch in the development of forestry in North America. While the period which Dr. Fernow typifies is rapidly becoming history, his teachings and his contributions have the quality of permanence. They have been always a source of inspiration and guidance to the pioneers of forestry; they will be infinitely more so to the actual managers of our forest lands as soon as real woods forestry comes into general practice. As with any great teacher, it is not the kind of theory that he happens to advocate that really counts, but the ability to teach how to think in his particular field. Theories come and go, but the ability to orient oneself in the details of complex problems is a lasting asset; he who teaches to meet ever-changing problems, not by a ready-made theory or hypothesis, but by a critical attitude and ability to discern between the essential and non-essential, is building on a solid foundation.

As a student under Dr. Fernow, I am personally indebted to him for whatever mental equipment in forestry

I possess, and particularly for my attitude toward the forestry movement as a whole. I consider it an exceptionally good fortune which permitted me to sit at the feet of so great a teacher, with whom forestry was not merely theory but a movement ever changing as life itself, and for whom problems became soluble not in ready-made formulas, but in the forces, economic and natural, that are at work.

*Clyde Leavitt, Forester to the Commission of Conservation of Canada:*

While Dr. Fernow's invaluable services as the pioneer of technical forestry in the United States are becoming increasingly recognized, there is as yet but inadequate public recognition of the similar part he has played in Canada. It was through his course of lectures at Kingston, Ontario, while he was still connected with Cornell University, that a really wide public interest in forestry first began to be aroused, resulting later in the establishment of forest schools and leading up to the employment of trained foresters by public and private agencies. In his remarkably active work in the field of forestry in Canada, Dr. Fernow has rendered notable public service as Dean of the Faculty of Forestry at the University of Toronto, as one of the members of the Commission of Conservation of Canada, as a member and Director of the Canadian Forestry Association, and as one of the progenitors of the Canadian Society of Forest Engineers. So extended have been his activities and so wide his influence that he may in all truth be termed the father of technical forestry in Canada, as well as in the United States.

## ANÆSTHETICS FOR TREES

SIR Jagadis Chandra Bose gave recently at the India Office some account of his investigations into the secrets of plant life and of the discoveries he has made therein, says the London *Times*.

Sir Jagadis said he had discovered that it was possible to transplant trees without injuring them if the operation were performed while they were subject to the effects of an anæsthetic. A tree so treated shed its leaves after transplanting in the summer instead of in the autumn, but it very soon recovers itself and became normal.

The most intense activity of life was often inperceptible, and it was only by making the unseen visible that the mystery of growth and movements of life would become revealed. He showed that by the crescograph the highest powers of the miscroscope were magnified 10,000 times. No experimental conditions for exhibition of growth could have been more difficult than in the depth of English winter, when plants were in their period of hibernation. In spite of this they were made to shake off their torpor, and the rate of growth was exhibited by the indicating spot of light rushing across a ten-foot scale in the course of twelve seconds, the actual rate being about a hundred-thousandth part of an inch per second. With the crescograph to guide him, the life-activity of the plant became subservient to the will of the experimenter.

A depressing chemical agent was applied and the march of life was slowed down; a timely application of a suitable stimulant revived the dying plant and exalted the growth-activity to many times the normal rate. The possibility of modifying the rate of growth was a matter of great practical importance, for the world's supply of food depended on the growth of plants. The rule-of-thumb method hitherto employed in the application of a few chemical stimulants and of electrictiy had not been found uniformly successful. Researches by means of the crescograph showed that a very important factor was the dose of application, any excess above the critical point bringing about a result diametrically opposite to what was expected. Thus while a particular intensity of electrical current accelerated growth an excess of current retarded it. The same was true of chemical stimulants.

## GREAT BRITAIN'S FORESTRY COMMISSION

IN a letter to the editor of AMERICAN FORESTRY Magazine, Colonel John Sutherland, of the Forestry Commission at Edinburgh, says: "We have now had the Forestry Commission established in Britain, consisting of Lord Lovat, chairman; Right Hon. E. D. Acland, Sir John Stirling-Maxwell, Col. W. Steuart Fothringham, Lord Clinton, Mr. L. Forestier-Walker, Mr. T. B. Ponsonby and Mr. R. L. Robinson. We are now engaged in preparing afforestation schemes and hope that by April we may have some acres planted, but we cannot achieve nearly as much as we would like in the first year as we have only now really got to work.

"I hope the proposals which are so admirably described in the AMERICAN FORESTRY Magazine for the reafforestment of the United States may take root and that Colonel Graves may receive all the support that is necessary to assure America of a good crop of trees for the future. It seems to me that it is very necessary both for America and for Britain that afforestation should be well established so that a sufficient supply of timber in both countries will be available within the next fifty years.

"It is very desirable that we should keep in touch with your work in America, and I will be glad, if you desire it, from time to time to let you know what we are doing at home.

"I retain many pleasant recollections of my association with the Forestry Engineers in France, and will always remember the excellent co-operation and assistance which was rendered to us by Colonel Graves, Colonel Greeley, Colonel Woolsey, Major Bruce and many others who were associated with us in procuring timber for the armies. Major Frederick S. Kellogg was the Officer in Charge of the First Company of Engineers which were lent to the British Directorate of Forestry, and to him and his staff we were indebted for the formation of an excellent operation in Les Landes.

"If you are in touch with any of these officers, I will be glad if you will convey to them my best wishes for 1920."

# THE HISTORIC TREES OF MASSACHUSETTS

IT IS claimed that Massachusetts has a greater number of historic or otherwise famous trees than any State in the Union, and this claim is strongly supported in a very beautiful book just from the press of Marshall Jones & Company, of Boston. It is called, "The Historic Trees of Massachusetts," and was written by James Raymond Simmons, of Syracuse, New York, Secretary of the New York State Forestry Association. Mr. Simmons, who was formerly Assistant State Forester of Massachusetts, writes with enthusiastic interest in his subject, and he has made a point of historical accuracy in his presentation.

A tree to be of historic value must be closely connected with men or events, and the very human sketches of the lives of these justly famous trees will hold the interest and attention of tree lovers from the beginning to the end of the book. "Speaking from the standpoint of trees as individuals," says the author, "we find that certain of them are identified with events of nation-wide and even world-wide importance. An historic tree commands in us the same quality of admiration which we feel for a great mind; it has been associated with the noted characters of its time; it is related to events whose results have affected the life and development of the community; it has demonstrated its ability to stand like a conqueror in the face of storm and adversity and has arisen superior to opposing forces of every description. We, therefore, honor its excellence and cherish its memory with that of our heroes!"

The book is beautifully illustrated, the photographs having been taken by the author—intimate studies of trees he loved.

Through the courtesy of Mr. Simmons and his publishers, AMERICAN FORESTRY is privileged to reproduce here excerpts from the book and illustrations. All of these trees have been entered in the American Forestry Association's Hall of Fame for Trees.

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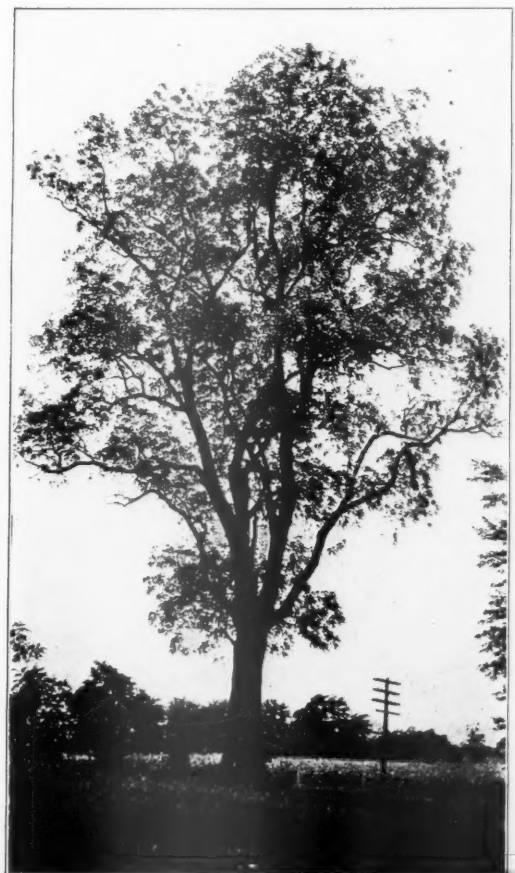
AT the right is shown the entrance to the beautiful stand of white pine at Abington, which has come to be known locally as Island Grove, but more generally as Abolition Grove, and is often pointed out to the stranger as "the place where the Civil War began." Here, in the open air, sheltered only by the whispering pines, great men, and women, too, stood and delivered speeches in the cause of abolition. Webster, "a man who loved mountains, and great trees, wide horizons, the ocean, the western plains, and the great monuments of literature and art," spoke in this historic place. Garrison was heard by the worthy people of Abington and the surrounding towns beneath these same white pines. The full list of those who spoke here includes some of the greatest minds of the Civil War period. A huge boulder within the grove marks the spot where the orators were wont to stand when speaking.



*THE BLACK WALNUT, WEST MEDFORD*

THE Black Walnut at West Medford is famed for its size and symmetry as well as its connection with local history. It is fourteen and a half feet in circumference, eighty feet in height and seventy-five feet in spread.

*THE ENTRANCE TO ISLAND GROVE*

THE WASHINGTON ELM AT CAMBRIDGE

THERE is probably no tree dearer to the hearts of the people of Massachusetts, or even of the country at large, than the Washington Elm at Cambridge. Travelers from every leading nation of the world have looked with reverence upon this spreading elm, and pondered long as they read the inscription on the monument at its base. Artists have painted it, poets have sung its praises, and most historians who have written of the Revolution remind us that "under its branches Washington took command of the Continental Army on the 3rd of July, 1775." More than a hundred and forty years have come and gone since that important and imposing event took place, and the Washington Elm still stands! Sorrowfully—now but a shadow of its former self.

THE LINDENS AT PLYMOUTH

NOW on Boston Common there has arisen on the site of the Great Elm, and from its roots, a sprout generally known as "the old elm's descendant." It is now a lusty tree 6½ feet in circumference, and is surrounded by an iron enclosure. Bonner's map of 1722—earliest record of famous trees of the Common, gives the location of the Great Elm—true native and king of the Common, which fell victim to a gale in 1876.

THE OLD ELM'S DESCENDANT

AND the lindens of Plymouth town! What manner of trees were those which tossed their giant branches against the stormy sky as the Pilgrims landed? Not the lindens, for while these grew beautifully in the Mother country, they had to be planted here. Certainly the planting of such trees in the New World was a mark of affection for things held dear in the Old, and the symbol of a friendship which even the misunderstandings of Revolutionary times could not shatter. America abounds with oaks, lindens and elms thus planted.

THE Roby Elm, so named from Parson Roby, who planted it, about the year 1770, stands on Main Street in the town of Saugus. Its circumference is 15 feet 2 inches, spread 100 feet and height 75 feet. The trunk is of unusual length, being about 30 feet, and numerous large branches sweep upwards for at least twenty feet more before spreading to form the crown. It is related that the parson selected and dug this tree with great care, placing it in his house, still a fine old residence and one of the landmarks of Saugus, where he kept it until the following morning and planted it in a suitable spot in his yard.

THE ROBY ELM

THE ELIOT OAK

THE summer tourist on his way to Cape Cod has often passed through the portion of Hingham lying just to the south of Nantasket Junction near the Cohasset town line. He has noticed, on the right hand side of the road a very large and symmetrical tree, known as the Cushing Elm. The name of Cushing has been justly bestowed upon the "ancestral elm." The family came from Hingham in old England and settled in Hingham in New England as early as 1638. Measured in the summer of 1916, the spread of the branches is over 100 feet and the circumference of the trunk 16½ feet four and a half feet from the ground.

JOHN ELIOT, justly styled Apostle to the Indians, and founder of Natick, first gathered the red men together, about 1632, "from their scattered kind of life into civil society" within the shades of the forest, and preached to them beneath a white oak, now a mighty tree, universally known as the Eliot Oak.

THE CUSHING ELM

*THE LAKEVILLE ELMS*

NEAR Middleboro, on the road to New Bedford, there are standing at the present time two beautiful and towering "wine glass" elms. As you approach them from the north they give the impression of being so close together that the tips of the branches interlock, but they soon break upon the view as two separate columns, seventy-five feet apart, lifting their heads upward into the sky. Each is slender and graceful, not possessed of great age, but singularly beautiful in its isolation from everything save field and sky and distant woods. The larger tree of the two has a height of 60 feet, a spread of 65 feet and a circumference at breast height of 8½ feet. The smaller is 60 feet in height, 50 feet in spread and 7 feet in circumference. Their historic value lies in their location in a one-time training field of Civil War times. They are known as the Lakeville Elms.

*THE AVERY OAK*

THE oldest white oak in Dedham bears the distinction of having once been selected as suitable material for the celebrated and much honored frigate that still lies at anchor off Charlestown—*Old Ironsides*. The amount offered was seventy dollars, but the offer was refused because the owner's wife, Mrs. William Avery, greatly admired the tree and prevailed upon her husband to spare it. This was about 1798, and the Avery oak is still with us, gnarled but vigorous. The present circumference at one foot above the ground is 23 feet 5 inches, and at breast height 16 feet 9 inches. The height is 68 feet and the spread of the branches 93 feet.

*THE HOLLISTON ELMS*

THE elms at Holliston were planted about the year 1747. They may have been six or seven feet in circumference during Washington's time, but they seem to have escaped the attention of those who would have given them a place in literature. The larger of the two trees is quite as remarkable in its way as the smaller and is certainly more magnificent. Unquestionably no pair of elms in Massachusetts can surpass these in size and grandeur; none give greater hope of preserving their beauty far into the future. For the larger tree the circumference at breast height is 18½ feet, the height is 92 feet and the spread 80 feet. For the smaller, the circumference is 16½ feet, the height 85 feet and the spread 85 feet.

THESE magnificent old elms in Lincoln stand directly in front of the oldest house in the town and about seventy-five yards from the State road leading from Concord to Boston, approximately two miles east from Concord. They are about 15 feet in circumference, and are beginning to decline. The branches have a highly muscular appearance but have suffered somewhat from insect pests.

*THE PAIR OF ELMS AT LINCOLN*

THE Boxford Elm, standing in front of the old house erected by Asa Perley in 1760, both house and tree have since remained as cherished landmarks of Boxford, as well as of Essex County. The elm gradually developed into a great tree—one of the greatest in Massachusetts. It has at the present time a circumference at breast height of 14 feet 4½ inches, a height of 70 feet and a spread of 100 feet. At about ten or twelve feet from the ground the trunk divides into five large branches which in turn subdivide to form a broad crown, overtopping the old Colonial residence, and lending its charm to the whole country-side.

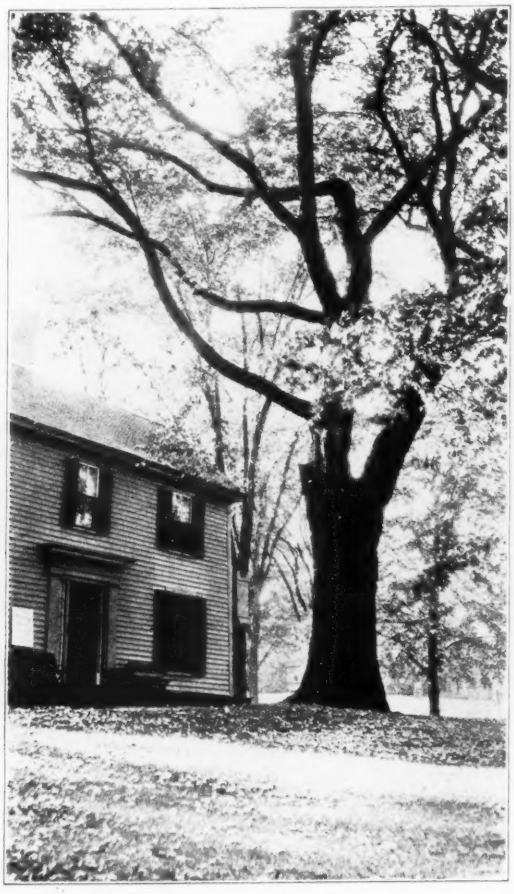
*THE BOXFORD ELM*

WHEN selecting a young tree for planting as a permanent, living monument, capable of occupying a given spot for from one hundred to five hundred years, one would hardly choose a fruit tree. And yet John Endicott, the earliest pioneer of the Massachusetts settlement under the patent, has left behind him a pear tree which he planted about the year 1632, and which still "bears more fruit than the whole town can eat" as the people say in Danvers. Measurements have no value and convey no meaning, as applied to this tree. Soil has gradually collected about the trunk until the two main branches appear to rise from the ground as separate trees. They evidently join under a heavy covering of sod. Surrounding them is a fence which acts as an effective protection. When the author photographed the tree it was covered with green fruit.

*THE ENDICOTT PEAR TREE*

*THE CHEEVER WALNUT*

AS a matter of passing interest it may be said that in the old town of Saugus there is a beautiful specimen of the black walnut, an older tree, supposedly, than the Roby Elm, concerning which the author of "Our Trees" (of Essex County) says, "It is quite among the possibilities that Cotton Mather could have stopped to rest beneath the shade of the 'Cheever Walnut' on his way on horseback from Boston, to witness witchcraft executions on Gallows Hill in Salem in 1692." It stands on Center Street and measures 13½ feet in circumference, 63 feet in height, and 87 feet in the spread of its branches.



*THE MONROE TAVERN ELM*

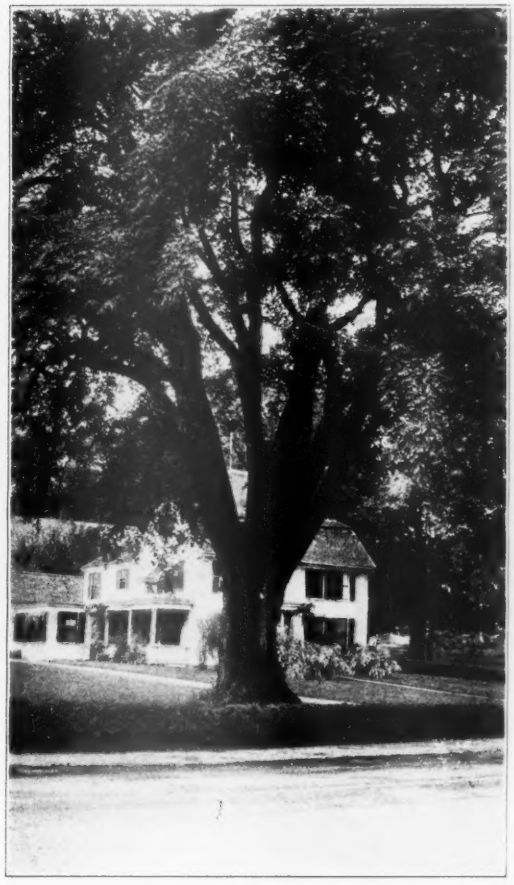
IN some respects these elms of South Chelmsford are more beautiful *as a group* than even the Hollinston elms, while the latter have that peculiar interest and charm that arise from great age. The South Chelmsford elms are on the W. R. Winning farm, not far from Carlisle Station. Each is 14 feet in circumference, and the combined spread of the branches is 125 feet. They are always conspicuous for the number of birds that nest in their branches, chiefly orioles and vireos.

*THE PAIR OF ELMS AT SOUTH CHELMSFORD*

DIRECTLY in front of the "Old Monroe Tavern" may be seen this beautiful elm. Here, on the day of the battle of Lexington, horses were tied to a series of iron spikes, driven at intervals of several inches, around the tree. One of these, over which the bark has not yet closed, may still be seen about an inch and a half below the surface. This spike is exactly four and a half feet from the ground. The circumference of the tree at this point is fourteen feet and five inches.

ON the bank of the Concord River, just beyond the Monument Street bridge, and not far from the famous "monument of the minute-man," there is a very old willow tree. Its girth is greater than that of any tree in Concord, and it is known to have been a sizeable specimen even in Revolutionary times. The circumference at breast height, measured from the upper side, is twenty-two feet; from the lower side, it is eighteen feet and eight inches; the height is forty-three feet and the spread sixty-three feet. At the point where the branches emerge from the trunk the circumference is nearly thirty feet.

THE OLD WILLOW AT CONCORD



THE MARLBORO ELM

AMONG the trees in historic Concord, belonging to a later time and associated with the years of peace and accomplishment rather than with those of war, are the two old elms in front of the Louisa May Alcott house, and the little grove of pines and spruces just beyond it. Under the shade of the elms once lived the author of "Little Women" and among the whispering pines Hawthorne walked, thought and wrote, or coversed with his friend, Thoreau. The elm at the left of the door as the visitor approaches the old house is thirteen feet in circumference, and the one at the right is fifteen feet. Their height is about sixty-five feet. The spread of the branches is not imposing, as one of the trees has lost nearly half of its limbs.

THE road over which Washington passed on his way to Cambridge is still in the favorite highway between Springfield and Worcester. It has now become the popular automobile route between those cities, and many a beautiful tree greets the traveler with its grateful shade. After passing the old oaks at Wayside Inn, going toward the west, you enter the town of Marlboro. Near the end of West Main Street, on the lawn of the Stevens place, stands an old elm tree, the dimensions of which are quite extraordinary: circumference at breast height, 17½ feet; height 74½ feet, spread of branches, 100 feet. The roots on the southerly side rise from the ground like an abutment, increasing the circumference at one foot from the ground to 29½ feet.

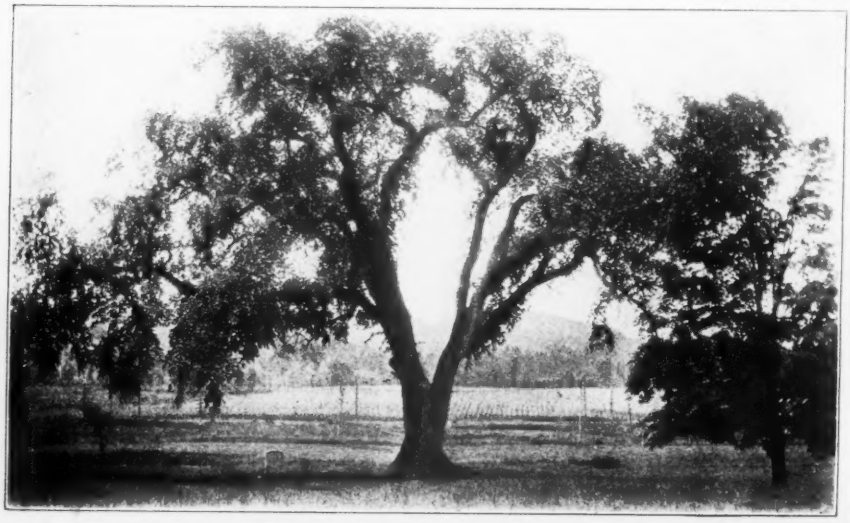
THE LOUISA MAY ALCOTT ELMS AND HAWTHORNE'S GROVE

*THE GRAFTON OAK*

WHILE the patriots in Boston were rallying beneath the branches of the Liberty Tree and the Great Elm, events of a similar nature were taking place in one of the small towns in the center of the State. Not far from the town square in Grafton stands a very fine red oak, bearing an inscription on a copper tablet. It has witnessed some stirring scenes in its day, among which may be mentioned the departure of troops for the battles of Concord and Lexington in the war for Independence. This old oak is 14 feet 5 inches in circumference, 62 feet in height, and 75 feet in the spread of its branches.

BEYOND the town of Palmer, a quarter of a mile from the railroad bridge, and near the center of a broad curve of the main road to Springfield, is a wide-spreading elm of the oak-tree type, comparatively strong and most pleasing in its proportions. Beneath this tree Washington rested and refreshed himself, and delivered a short address only three days previous to taking command of the army at Cambridge. The elm took its name from the tradition, apparently well attested, that General Washington, accompanied by his Staff, General Lee and the deputation sent from Cambridge to Springfield to meet and escort him to headquarters, halted with his party under the shade of this tree to rest and lunch about noon, June 30, 1775. Very naturally the party ordered milk and *other necessaries* from Captain Graves' tavern. Like many trees of its kind, this elm has developed greatly at the base. At one foot from the ground the circumference is nineteen feet, while at breast height it diminishes to fourteen feet and one inch, increasing again as the branches are approached. The height is fifty-five feet, and the spread of branches ninety-five feet.

*THE SPRINGFIELD ELM*



*THE WASHINGTON ELM AT PALMER*

THIS is the last survivor of a little group that stood in Springfield Court Square in the days of Washington, near the Old Tavern, "allowing the old yellow-bodied stage just room enough to swing around to the front door in fine style!" General Washington rendered the elms historic by his visit there when on his way between New York and Cambridge, and he rendered one more famous than the others, *i. e.*, the elm that stood directly in front of the tavern door, for here it was that he sat and "drank his flip." The city may well be proud to call the survivor of the group the Springfield Elm. Its dimensions are surprising and gratifying—height 102 feet, spread 112 feet, circumference at breast height 19 feet, 9 inches.

OLIVER WENDELL HOLMES included the elm at Sheffield among those of greatest size, beauty and symmetry of form. Doubtless the Sheffield elm was so classified on account of its great beauty and spread of branches, for it fails to show twenty feet of clear girth at five feet from the ground, even at the present time. It has always been considered as one of the most beautiful elms in Massachusetts, and though old age has at last crept upon it, the individuality in the arrangement of its numerous branches continues to produce a strong, graceful and pleasing appearance. In 1916 it measured 3 feet from the ground, 20 feet and 3 inches in circumference, and at six feet 19 feet and 7 inches. The spread westward was fifty-four feet and the height eighty-two feet. Tradition has it that the old elm was standing when the town was settled, in 1725.

THE SHEFFIELD ELM

THE DEERFIELD BUTTONWOOD

AMONG those few trees which may be called elms of the first class is the Lafayette Elm. This tree is situated southwest of the village of Ware, on the road to Palmer, and is 20 feet 7 inches in circumference, 75 feet in height and 100 feet in the spread of its branches. The enormous trunk divides at about ten feet into three branches, the largest of which subdivides into four more. The smallest of the four is fifteen inches in diameter. In general appearance the tree is slightly over-developed on the east side, one great limb stretching in this direction for more than sixty-five feet. Tradition says that during Revolutionary times, Lafayette rested underneath this tree while on his way to meet Washington, and at a later date the elm was named for the famous Frenchman.

IT is difficult to select a single tree from among the many beautiful ones in historic old Deerfield, but the buttonwood in front of the academy is at least representative. It is now eighteen feet in circumference and one hundred feet in height and spread. It stands within the bounds of what was once the enclosure of the fort which was built in 1689. If size is any test of a tree's age, this buttonwood was standing at the time of the Indian wars, for its circumference is larger than that of the Charlemont buttonwood by about two feet. Many thrilling events took place within a radius of fifty yards from the spot occupied by the tree.

THE LAFAYETTE ELM

"THE ELM BY THE LITTLE BROWN HOUSE"

SINCE the great "Willard Elm" is no more, the elm on the Albany Road competes for honors as Deerfield's most famous tree. It is worthy of note that the Indians usually led their captives past this tree to a ford in the river, and thence to the Mohawk trail. The tree is known as "the elm by the little brown house." Thickly growing bushes and vines conceal its huge abutments, which stretch out on each side of the tree to a distance of seven feet. In girth this tree qualifies as an elm of the first class, being 20 feet in circumference, 82 feet in height and 100 feet in spread. With the exception of a few dead branches the tree appears to be in good health.

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THE Harrington Elm stands in front of the L. A. Austin place on Massachusetts Avenue, East Lexington. A legend upon its trunk informs us that *"This tree was planted in 1732 by Jonathan Harrington, father of the last survivor of the Battle of Lexington."* It is 70 feet in height, 16 feet 4 inches in circumference and 90 feet in spread. At about ten feet the trunk divides into four great limbs. One of these, on the northerly side, divides again into four branches. There were originally five sub-divisions to the trunk but one fell in a heavy gale. The wound has been treated and is properly healing.

THE CHARLEMONT BUTTONWOOD

ONE of the most picturesque spots on the "Mohawk Trail" may be found in the westerly portion of the little town of Charlemont, just beyond the old covered bridge which crosses the Deerfield River. At this point a buttonwood tree stands on the side of the slope a few feet above the road, and leans slightly forward as if to protect a spring of sparkling water near its base. Not far away, on the hill above, the first pioneer settler of the township perished at the hands of the Indians. Much bloody warfare surrounded the settlement of this part of the country, to all of which the old buttonwood was a silent witness, and it stands today the most fitting memorial to those frontier heroes—a living monument. Its topmost branches reach to a greater height than the graves on the hill, for the tree is ninety-eight feet high. Beneath the branches, which spread themselves over eighty-five feet of space, passes the "trail;" and near the massive trunk, sixteen feet in circumference, still bubbles the crystal spring water.

THE HARRINGTON ELM

SUNDERLAND possesses a gigantic "Old Buttonwood," the largest, doubtless, in Massachusetts. The giant limbs, stretching upward for a hundred feet, more or less basket-shaped, and spreading to an equal distance, are plainly visible from Sugar Loaf Mountain, and from several points along the highway leading north. Their characteristic color stands out conspicuously against the green background of other trees. More marked than any other particular feature is the ponderous trunk. It reminds one of an elephant. The girth at breast height is 20 feet 6 inches, and it is very nearly uniform to the dividing point, which comes at about fifteen feet. Historically, the tree ranks with those of Deerfield, although no battles are actually known to have taken place in its immediate vicinity.

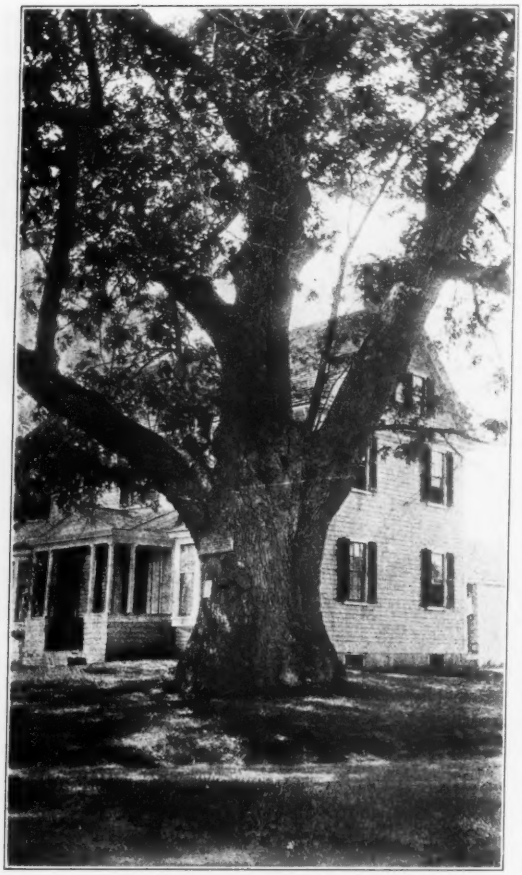
*THE SUNDERLAND BUTTONWOOD*

*THE OLIVER WENDELL HOLMES PINE*

TRULY the author quotes: "The trees of Boston Common are historic trees because the Common itself is historic." The earliest record of famous trees within the bounds of the Common is Bonner's map of 1722, which gives the location of the Great Elm and of a group of elms at the corner of what are now Washington and Essex Streets. One of these was the famous Liberty Tree. The scene has been a constantly changing one through the years that have followed since this early map of Boston was made, for practically every tree now standing on the "peninsula" was placed there by the hand of man. The Liberty Tree was destroyed by the British in 1775, while the Great Elm, the true native and king of the Common, survived until 1876, when it fell in a gale. Memorials now mark the passing of many trees of individual historic fame on Boston Common—trees which will, however, live forever in the documents which shape the earliest history of our country. Surpassingly beautiful are the trees of the Common today, but there are few now standing on this historic ground more than one hundred years old.

AS you walk along the old road to Lenox, you will mark in a wide sweep of lawn the lone and superb pine so much loved by Oliver Wendell Holmes. This historic pine, one of the favorite trees of a noted personage, is an excellent representative of our great New England conifer. You measure its trunk and find that it is 16 feet 4 inches in girth. You wonder at the great depth of its shadow and find that the spread of its branches is nearly 90 feet; and you look upward to its topmost branch and find, if you have a measuring instrument, that it is 97 feet from the ground. There may be a larger white pine than this *somewhere* in Massachusetts, but—where?

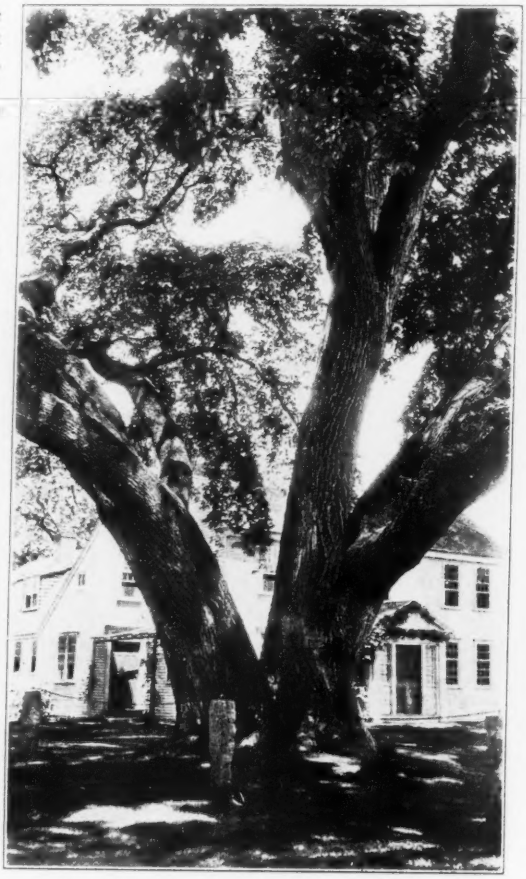
*BOSTON COMMON IN WINTER*



*THE BEAMAN OAK*

WHILE the famous Cunningham Maple and the Carter Oak are both in advanced stages of decay, and appear "like veteran warriors, beaten down in battle, bearing up their banners to the last," the Beaman Oak remains in all the glory of its strength, and is claimed to be the largest red oak in Massachusetts. It marks the place where Gamaliel Beaman, an early settler, built his house in 1659. The measurements are as follows: Circumference at the ground, 29 feet; at breast height, 20 feet; at five feet from the ground, 19 feet 9 inches; height, 75 feet; spread of branches, 90 feet.

THE only tree in Massachusetts which, at maturity, has ever approached the Rugg Elm in the grandeur of its spreading branches is the elm which stands on the Knowlton farm in West Acton. This superb elm lost over half of its branches about three years ago, when they fell of their own weight in a very ordinary gale. Timely assistance would have preserved this tree for more than a generation. It has long been credited with possessing the greatest spread of any elm in this section of the country, and the remaining half section covers fully a hundred feet of ground. The largest limb, which was shorn off and still lies where it fell, is 11 feet and 4 inches in circumference. It would seem as if strength had been sacrificed for beauty, and as if a noble head had at last fallen from shoulders too weak to support it. The trunk is fourteen feet, eight and a half inches in circumference and thoroughly sound. The height of the tree is sixty-seven feet.



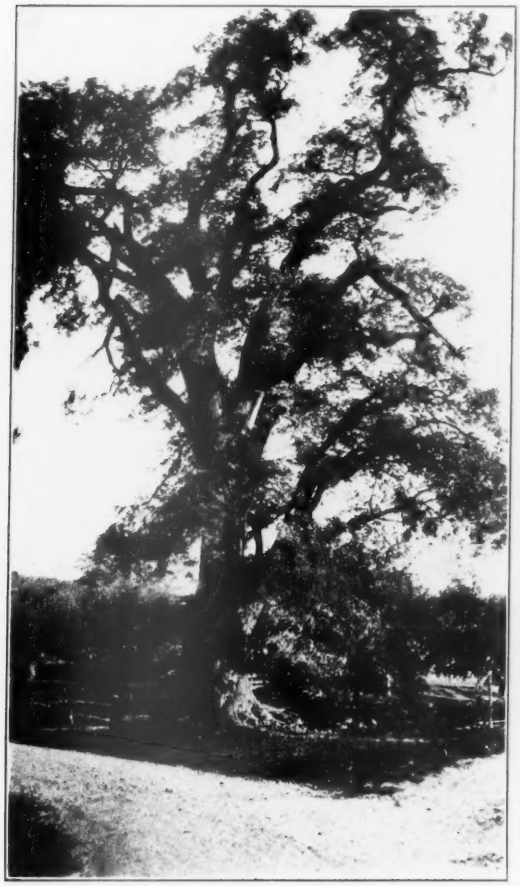
*THE RUGG ELM*

*THE ELM AT WEST ACTON*

THE Rugg Elm (also known as the Gates Elm) at Framingham, situated about two hundred yards from the turnpike road, between Framingham and Fayville near the grounds of the Country Club, is without doubt the largest elm to be found anywhere in New England. The circumference at one foot from the ground is 28½ feet, and at about three feet from the ground the trunk divides into two parts, one of which, at breast height, is 17 feet and the other 14 feet in circumference. Between these two trunks there is a peculiar woody formation, or "nubbin" which may at one time have been the beginning of a third section. The two gigantic trunks sub-divide at about eight feet into three large branches each, and in combination, form one of the most remarkable crowns that can be conceived of. The spread of the branches is 145 feet and the height of the tree is 70 feet. The age of the Rugg Elm is variously estimated at from 300 to 400 years.

AMONG the towns in eastern Middlesex, just north of Boston, notably Medford and Winchester, there are many beautiful trees of all kinds. One of the most remarkable specimens is the elm near the railroad station in Winchester. The Winchester Elm is not among the largest of our famous trees, being only ten and a half feet in circumference, but no more beautiful tree may be found in this section. It has adapted itself to the conditions of our modern city streets and flourishes in the very center of one of the main thoroughfares of Winchester.

*THE WINCHESTER ELM*



*THE HUBBARD ELM*

RETRACING our steps from Berkshire to the sea, the last of the famous trees is also one of the most magnificent in the whole collection. Behold an apple tree having the sinews of an oak, the spread of an elm and a crown surpassing both in the beauty of its leaves and blossoms! Imagine it in full bloom, its blossoms nearly the size of wild roses, its largest limbs nearly six feet in girth stretching out thirty feet on every side; its trunk ten feet in girth at the smallest part and fourteen and a half feet at the ground. One envies those fortunate residents of Cape Cod who boast that they played under this "umbrella tree" when children and climbed in its branches. It stands on the estate of Mr. Livermore, of Marshfield Hills, and is known to be more than one hundred years old, having been planted by Stephen Sherman, who was a resident of Marshfield for nearly ninety years.

A "SPLENDID old wreck of an elm" at North Andover, known as the Hubbard Elm, is the peer of Essex, and may be considered as a strong contender for the title of the largest elm now standing in Massachusetts. Though hollow, it commands the greatest admiration and wonder, and its mighty abutments stretch out for several feet on all sides, as if inviting the beholder to step thereon and grasp the deep-furrowed bark in a fond embrace! On the ground about the tree lie several of the once powerful limbs in varying stages of decay where they have fallen. The complete picture produces in the observer the keenest of emotions, and he leaves it with regret, knowing that the time will not be long during which he may be permitted to gaze upon so mighty an elm. The circumference is 24 feet 5 inches at breast height, and the tree is 98 feet high. The spread is not over 65 feet, probably a little more than half of what it was before the beautiful, long limbs fell to the ground.

*THE APPLE TREE AT MARSHFIELD HILLS*

# EDITORS CALL BUSINESS INTERESTS

RESPONDING to the call of the American Forestry Association to enlist in the battle for a national forest policy and for better fire protection of the forests the editors of the country are giving columns of space to the campaign. They are treating most generously all the news being sent out by the Association that has to do with trees and by calling the attention of the public to the value of forests and trees they are all aiming at the common need so vital to the industry of the country, namely, a national forest policy. Some of the editorial comment follows:

*Buffalo Express:* "In a broad sense reforestation should be the national forest policy. For every tree cut down require that two shall be planted—not at some future time, but AT ONCE. There ought not be any need for argument."

*Birmingham News:* "The American Forestry Association persists in its insistence that every school take up tree planting. Not such tree planting as is expressed annually . . . but such a conservation of forestry as will constrain every youth in the land to plant. What must inevitably spring from that example is the great thing; federal forest conservation on a great scale."

*Syracuse Herald:* "Wood is one of the chief reasons for the high cost of living and the American Forestry Association calls attention to this with some startling figures. There is scarcely a commodity that is not shipped or handled in a wood container of some sort."

*Canton News:* "According to the American Forestry Association, the consumption of pulpwood has increased 100 per cent in 20 years while no systematic work has been done to renew the forests. Years are required to grow trees so prompt action is needed."

*New York Mail:* "The value of the forest fire service is indicated by the fact, as the American Forestry Association points out, fires destroyed timber valued at no less than $40,000,000 and the average loss from forest fires in 1916-1918 was $21,000,000."

*Springfield, Ill., Journal:* "The American Forestry Association has suggested that the anniversary of Theodore Roosevelt's death be observed by all persons interested in the conservation of the nation's natural resources. If their suggestion is adopted January 6 each year, the country will recall Mr. Roosevelt's service in this cause."

*St. Paul Pioneer Press:* "What a pity and what an insane fury of recklessness is it that finds us now with three-fourths of our forests gone without provision for their renewal and still not a move on the part of Congress to save the country from utter depletion of its remaining forests upon which directly depends the living of hundreds of thousands and upon which all society leans for necessary articles, including the materials for dwelling houses and furniture! The American Forestry Association is carrying on propaganda . . . to serve as a means of publicity for the larger cause—the replenishment of the forests."

*Rochester Democrat and Chronicle:* "There is much to commend in the proposition to make the anniversary of the death of Theodore Roosevelt a day to be observed by the nation as a time to emphasize the need of forest conservation. The American Forestry Association should be encouraged in its effort to have this day set apart by law for such purpose."

*Florida Times-Union:* "The seriousness of the forestry situation in this country is being brought to the attention of the people by the American Forestry Association and there is hope their work will have the effect of awakening a genuine interest in saving and recouping our timber interests."

*Salt Lake Tribune:* "The American Forestry Association has a message for the business interests of the nation. It is, 'stop throwing the forests of the nation in the waste basket.' Which is another way of arguing against the wanton waste of paper. The pulpwood situation certainly is one which gives force to the plea."

*Cleveland Press:* "Charles Lathrop Pack, president of the American Forestry Association, declares that because of the drain of war the warning of Theodore Roosevelt as to a woodless age is ten times more important today than when the late President expressed it. 'Our forests are like a bank' is the way Pack puts it, 'for if we expect to draw out we must make deposits.'"

*Los Angeles Record:* "At the annual meeting of the American Forestry Association a resolution was adopted calling on the schools, women's organizations and public bodies generally to make January 6, the day Theodore Roosevelt died, 'Roosevelt Day' and to observe it with exercises appropriate to the policy of forest conservation."

*Meridian, Miss., Dispatch:* "If the American people realized the money value of trees to themselves as well as the nation this country would not be in the danger it is of forest denudation."

*Tallapoosa, Ga., Journal:* "It takes from sixty to a hundred years to grow a large fat log. It takes about fifteen minutes to cut it down. The answer is easy. Unless something is done to preserve the forests of the country it is only a matter of years before we will have practically no lumber, and the annual floods and water flows will testify to the deforestation of the watersheds."

*Atlanta Journal:* "Ponder the fact that the United States has barely one-fourth of its original forest and that this is being destroyed three times faster than it is being reproduced? The situation is one to challenge every thoughtful American."

*Oshkosh Daily Northwestern:* "If the United States allows its forests to be permanently destroyed it will face a bitter reckoning. And neither public nor government can plead ignorance of the dangers of our present practice."

*Petersburg, Va., Progress:* "The mountains and hills denuded of trees mean an economic loss both on account of the effect of such denudation upon rain fall and the loss of timber for building purposes."

*Norwich, Conn., Bulletin:* "What the outcome will be the future will reveal but it cannot fail to be appreciated that a move in the right direction is being made when the American Forestry Association approves a plan of co-operation on the part of the federal and state governments for the preservation and development of woodlands. Great inroads have been made into the forests of the country."

*Rome, Ga., Herald:* It is indeed high time to take measures to stimulate forest growth in the United States and take all necessary measures for the protection and conservation of our whole forest system."

*Findlay, O., Republican:* "A quarter of a century ago wood was plentiful and cheap. Today it is just the reverse in both cases and the time is rapidly approaching when there is going to be little or no wood and the big forests that have produced the supply will be a thing of the past."

# TO RALLY TO THE CAUSE OF FORESTRY

*Dalton, Ga., Citizen:* "America needs a more thorough awakening to the needs of tree planting now to insure sufficient timber in the future. Industries are calling for timber but the areas that formerly furnished the trees have been partially cleared and little thought has been taken for the future."

*Providence Bulletin:* "Save paper says the AMERICAN FORESTRY Magazine. A cut of 25 per cent in paper would mean six million less tons of freight for railroads to handle."

*Indianapolis Star:* "In response to senatorial request for information in regard to depletion of the forests, the American Forestry Association has presented figures to show the New England States are no longer self-supporting in a lumber way; the center of the lumber industry is fast moving to the Pacific Coast; the Lake States are now importing lumber to keep alive the wood using industries of that section. It is time all land owners should give heed."

*New York Evening Mail:* "The enormous economic importance of our forests is shown by the figures given in the latest census report. These figures show that of the round total of 276,000 manufacturing establishments in the country, 52,000, or 19 per cent, are dependent for their continued operation, either wholly or in part, upon the output of raw material from the forests.

"And yet we have no national policy for the conservation and the development of our timber resources. Not only are we cutting down our forests, for the most part with hardly any regard for future needs, but are giving scant attention as a nation to the protection from destruction of the resources that we have not yet succeeded in squandering.

"This carelessness is indicated by the attempt in Congress to reduce to the vanishing point the government appropriation for the forest fire service. This contempt for one of our most valuable natural resources, the basis of industry in which a total of $3,000,000,000 is invested, is incomprehensible. The American Forestry Association, of Washington, deserves hearty commendation for its efforts to rouse Congress and the American people to the importance of a national forestry policy as a fixed feature of our efforts to make the best possible use of our fast-vanishing natural resources."

*Birmingham News:* "The American Forestry Association calls attention to the fact that the forest fires in this country burn ten times the area of devastated France every year. Using that terrific fact as a text, Charles Lathrop Pack, president of the Association, preaches a powerful sermon on the imperative need for a national forest policy.

"He explains why the penny newspaper and the two-penny newspaper are things of the past. He sees in the gradual depletion of American forestry an actual menace to education. Some of his recent utterances are alarming, and his data, carefully gathered, confirm the opinion rapidly spreading that unless the United States buckles down to forest conservation, not only will newsprint become higher, but agriculture must inevitably suffer.

"But the conservation of timber for newsprint purposes is even less important than the conservation of forestry for the making of homes for human beings to live in."

# NATIONAL HONOR ROLL, MEMORIAL TREES

**Trees have been planted for the following and registered with the American Forestry Association, which desires to register each Memorial Tree planted in the United States. A certificate of registration will be sent to each person, corporation, club or community reporting the planting of a Memorial Tree to the Association.**

### PARIS, FRANCE

By American Graves Registration Service: Lieut. E. R. Bolinder.

### ANDALUSIA, ALA.

By Andalusia High School: James Malcomb, Otis Battle, Arthur Perrett, Sidney Blair, Ary Dukes, Columbus Gillis.

### BIRMINGHAM, ALA.

By United Daughters of the Confederacy: Lieut. Pilot Meredith Roberts.

### SAN FRANCISCO, CALIF.

By Native Sons and Daughters of Golden West: John E. Fitzpatrick, Herman Cassens, Forest E. Stout, R. C. Mehrtens, Oscar Peterson, Harry Mack, Arthur E. Johnson, Lawrence Sweeney, Leon Vander White, William A. Nonnemann, Gustave Nonnemann, Narciseo De Anti, Harold Feldbusch, William Hagedorn, Edward J. Strohmeier, William Griffin, Leonard Husing, Angelo Cincotta, S. Brilliant, Robert Sturdevant, Walter P. Kenney, Victor H. Davis, Fred Nash, George W. White, Alfred J. Murphy, Ray Healey, John Ward, Thomas J. McDermott, Ernest Hartman, Jr., Hugo Oliver, Frank Legnitto, D. A. Dineen, John Murray, Loring C. Schaffer, H. F. Margey, T. J. Brady, Leon Jacquemet, W. Thompson.

### FT. MORGAN, COLO.

By New Movement Class, First Presbyterian Sunday School: Alfred James Creighton, Melvin Walter Trewit.

### ATLANTA, GA.

By J. Bentley Mulford: Edgar Allen Poe By William F. Williams:. By Will B. Lane: J. G. Holland. By Southern Mountaineer Educational Association: Miss Helen Gray. By Oglethorpe University Woman's Board: Sidney Lanier. By Sacred Heart Altar Society: Dr. Father Ryan. By Writers' Club: Dr. George M. Niles, Mrs. Lucy Lowery Harper. By Druid Mills Patriotic Club: Paul Hamilton Hayne. By Nineteenth Century History Club: H. E. Harman. By Daughters of 1812: Miss Virginia Arnold. By Atlanta Drama League: Granville Barker.

### ELLAVILLE, GA.

By Daughters of Confederacy: Ira Binford, Leon Carter.

### LAGRANGE, GA.

By United Daughters of the Confederacy: Jesse Atkins, Joel M. Bohannon, McKinley Joe Brock, John H. Cannon, Hoke Frazier, Ferrel L. Hamer, Charles Parks, Amos Payne, Juel Reid, Baxter L. Schaub, Luther Storey, Juel Taylor, Thomas Thomaston, Knox F. Thompson.

### MIDDLETON, GA.

By A. M. Pleyte: Mrs. Eugene B. Heard, Miss Lois Perrin.

### MILLEDGEVILLE, GA.

By Federated Clubs of Baldwin County: Isaac Newton Maxwell.

### QUITMAN, GA.

By Mr. and Mrs. M. F. Simpson: Hiram Treadaway.

### ERIE, ILL.

By Woman's Club: Keith Denton, Corp. Warren J. Mahana, Ralph E. Olinger, John E. Smith, Lieut. Raymond F. Pearson.

### KEWANEE, ILL.

By Woman's Relief Corps: Hugh McGinnis, Benjamin McDaniels, James Johnson, Carl G. Johnson, Russell R. Brooks, John Schram, Otto Reich, Herbert E. Bailey, John Ray Dixon, Ernest Ouart, Marie Girvin, Charles Van Wassenhove, Carroll H. Radford, Mike Mikenas, Lawrence Lyons, George Clashner, George A. Johnson, Charles J. Sobotta, Guy Turnbull, Louis W. Tesch, Karl Sawisky, Lloyd D. Elliott, John Ramont, Leo G. Leggins, Axel K. Peterson, August S. Sobotta, William Euard, Merwyn Palmer, Bert Tann, William Helpel.

### EVANSVILLE, IND.

By Trinity M. E. Church: Lieut. Judson McGrew.

### JEFFERSONVILLE, IND.

By Ann Rogers Clark Chapter, D. A. R.; Bethlehem Township, Charlestown Township, Monroe Township, Oregon Township, Owen Township, Silver Creek Township, Union Township, Utica Township, Washington Township, Wood Township, City of Jeffersonville.

### KANSAS CITY, KANS.

By Camp Fire Girls of Argentine High School: Camp Fire Organization.

### BRYAN, OHIO

By Mr. Andrew Grim: Kenneth K. Grim.

### TACONY, PHILADELPHIA, PA.

By Holy Innocents' P. E. Church: William Thompson, William D. Oxley, H. Stuart Lytton, Thomas W. Astbury.

### COLUMBIA, TENN.

By Business Woman's Association: George McKissick, Sergt. Thomas A. Mitchell, Sim Watson, Earl Flowers, Ernest Ferris, Lieut. L. O. Carne, Marcus Springer Hay, Culess Dean Christopher, Lester Akin Barnett, William J. B. Harlow, Oscar Frost, Herman Grady Agnew, Dalton (Dock) Brown, Merritt Jones, Flavious J. Morrow, John O. Baxter, Clarence Kilpatrick, Henry Gulley, Lonnie Lee Blackburn, Harry Lanier.

# NATURE ADVENTURES IN THE NATION'S CAPITAL

BY DR. R. W. SHUFELDT, C. M. Z. S.

PHOTOGRAPHS BY THE AUTHOR

IT IS remarkable how much pleasure there is to be derived from short outings into the neighboring country surrounding almost any of our large cities, and how much there is to be learned from them. Any one possessing a strong leaning toward what the outdoor world of nature has to offer, may try the experiment in the less frequented parts of the environs of our National Capital—in the timbered and open country of the District of Columbia. One of the best times of the year for such an outing is during spring or early in the summer; although each and all of the seasons have their charm. For a region so well within the more densely populated part of the United States, it is wonderful what an interesting flora and fauna it possesses; and how much of it all we still have with us! When this is said, a distinct reference is made to the vandalism of many who resort to the woods for apparently no other purpose.

THE SECLUDED RETREAT OF THE LATE JOAQUIN MILLER, AN AMERICAN POET, WHO LOVED TO LIVE CLOSE TO NATURE

Fig. 1. His real name was Cincinnatus Heine Miller (born November 10, 1841), he having adopted the pseudonym he did from having written in defense of Joaquin Murietta, a Mexican brigand.

Only too often, at the very outstart of the exploration, one is confronted with the most ruthless examples of destructiveness. We see whole beds of trailing arbutus torn up, quantities of bird-foot violets gathered, roots and all, only to be thrown aside almost as soon as taken, and entire limbs of flowering dogwood broken off, generally by the automobilists, who seem to delight in returning to the city displaying to the public these evidences of their mode of studying nature.

It is even still more harrassing to see, upon one's very entry into the nearby woods, lying upon the ground, some beautiful bird of the spring, which has fallen to the only too certain aim of some thoughtless boy with his vicious air gun, having been doubtless more bent upon testing his marksmanship than to consider the result of his wanton ruthlessness.

But we hasten through this depressing area, and in a very little while we are in a region which, although visited, is not visited nearly so often, nor by so many people. Here we are more likely to discover evidences of the occasional presence of those who love to live close to nature, than to find results of the acts of the despoilers of her charms. Chief among the former are the little huts for spring and summer occupation; they need no description, and the charming life one may lead in such a habitation can readily be conjectured. No one ever loved such a life more than did our typically American poet of the woods, the late, much beloved Joaquin Miller. Although his modest little house now stands close to a roadway where scores of automobiles pass every day, yet the hut and the surroundings are held in the greatest respect; even the rural vandal has apparently said to himself: "Hands off;" the place is sacred.

When we come to consider what a small area of territory the District of Columbia actually includes, it is quite surprising to find how diversified much of its physical character or topography really is. Some parts of it are markedly hilly, the hills often supporting fine growths of timber composed of a great variety of trees. Then there is plenty of low, flat land, marshes, swamps, and rugged ravines, and it is traversed by one big river, the Potomac, into which empty many small creeks and one or two sizable streams. The Anacostia River is another good stream, with interesting country along its banks. What one misses more than anything else, however, are good ponds and lakes; there are very few of these, and so there is considerable lack of opportunity to observe pond life, although it is by no means entirely lacking.

Across from the rocky shores of the Potomac, the land topography is precipitous and studded with great masses of granite rock (Figs. 3 and 4); and specimens of one kind or another are to be collected there that may or may not occur in the District.

With respect to the flora and fauna of the latter, there is a great deal to be met with in either that any nature lover or naturalist will find of more than passing interest. Among the mammals, there are plenty of racoons, opossums, woodchucks, skunks, weasels, various shrews and mice, squirrels, muskrats, mink, and others. As for the

birds, the list is altogether too extensive to enumerate, as practically it is the avifauna of the Middle Atlantic States. Then, among the birds we may always expect to meet with "stragglers" from time to time, either from the North during very cold winters; from the South during unusual seasons, and, finally, certain aquatic species straying up the Potomac.

The District's reptiles and batrachians are also interesting, and more or less numerous; the explorer and student may, and very likely will, meet with various species of snakes, one of which—the copperhead—is venomous; a few lizards, salamanders, and newts; a land tortoise and several turtles, and quite a number of frogs, toads, and hylas. There is likewise a good representative fish fauna in the rivers, creeks, and small ponds (Fig. 5).

While it is not at all likely that any *new species* remain to be described among any of these vertebrate groups, still there is some probability that new insects, or even mollusks and other invertebrates yet remain unknown to science in the District of Columbia; not many, perhaps, but possibly a few. The same may be said for the lower forms of plants, though not with equal certainty.

ONE BEAUTIFUL BIRD LESS—THE VICTIM OF A BOY'S AIR GUN

Fig. 2. This Golden-winged Woodpecker was photographed, without being disturbed, upon the very spot it fell dead. A pitiful sight upon a beautiful day in early spring.

As to flowering plants, the list is by no means a short one, for the writer has photographed upwards of one hundred different species, and still others are looming up on every hand for similar work in the future. The same for trees and shrubs, not to mention other forms of vegetable life, with many fungi and other growths. Comparatively but little is known of the special anatomy and physiology of all these forms, both in the case of animals and plants; but this is quite apart from what the explorer sees in the physical geography of the District and its representative flora and fauna as a whole.

In undertaking an expedition for the purpose of exploring the District—be the time to be occupied one day or one week—the explorer should be properly equipped, in that the object of the outing may be accomplished—barring changes of weather and accidents. If he intends to do field photography, a suitable camera and outfit will be necessary, the best sizes being either a 5 x 7 or larger. Many prefer very small cameras, and depend upon enlargements made from the negatives; and it may be said that in some cases excellent results can thus be obtained. From time to time a trip will be undertaken with but a single object in view, as for example the capture and photography of small fishes, either pond or river forms. Then it will be best to carry a special aquarium in some instances; but nearly all the little fishes of the District bear transportation well in a small can, if the water be cool and constantly changed. This is especially true of the minnows, sunfish, catfish, and others. Any of these may be taken along the banks of the river and streams where they occur, while the Georgetown Canal offers another excellent place to meet with them.

Large specimens, such as big turtles, snakes, and some mammals, are best carried back to base in a strong bag of suitable size, and closed with a draw-string. These specimens will occasionally give a bit of trouble, and may cause some amusement to passengers in street cars, when one is compelled to travel in them. For example, the big snapper shown in Figure 6 was a very powerful creature, its shell being over a foot in length. He was gentle and quiet enough in the field; but almost as soon as we were settled in a street car, the fellow became very uneasy, and soon made frantic efforts to get out of the bag. This attracted the attention of one or two of the passengers, and they became greatly amused at the writer's predicament. However, the snapper was in the right; and later my regrets were genuine when the news came that he had been crushed between the powerful jaws of one of the larger alligators in the tank at the "Zoo," where the specimen had been sent for public exhibition.

In American Forestry the writer has already given many accounts of the wild flowers that occur in the District, and described the pleasure to be derived from their collection and study. But apart from the joy of seeing the first bloodroots and wind flowers in the earliest days of spring, there is probably no plant that will catch the eye and command the attention of the explorer with

THE DISTRICT BANKS OF THE POTOMAC

Fig. 3. This view is just above Chain Bridge and looking up the river. During unusual floods the water covers everything here in sight, save the timbered hills.

greater certainly than the famous Indian pipe or ghost plant, of which an excellent illustration is given in Figure 7. This plant is especially conspicuous when one comes across it on a cloudy day and it has appeared in very dark soil, the latter being so banked as to give the plant a black background, as we see it in the figure. In some parts of the District, Indian pipe is fairly abundant —that is, one may come to a place where some eight or a dozen plants are scattered over an area of twenty square feet; but, again, one may travel through the woods for miles and not see another specimen of it. The same may be said of the false beechdrops and one or two other parasitic plants. Such plants as these are quite difficult to safely carry back to the studio for the purpose of photography; still it may be successfully accomplished if great care is taken with the specimen. One should have along with one's collecting kit a good, big knife or a small trowel with which to take up the entire plant, leaving a generous supply of earth about its roots. Disturb the setting of the plant as little as possible, and consign the entire thing either to a good-sized tin can or to a collecting basket of the proper shape. Very often, everything else being equal, one can secure a far better negative of such a subject in the studio than can be obtained of the plant where it is found; for in the first instance both light and the movement of the air is completely under control. Many hardy plants travel well to the home from the nearby collecting ground simply rolled in a newspaper cone. Perhaps one of the best carriers is the regulation cylindrical botanical carrying case, which likewise has the advantage that many insects, small snakes, toads, and frogs, and so on, may also be taken home in it for study and for photography.

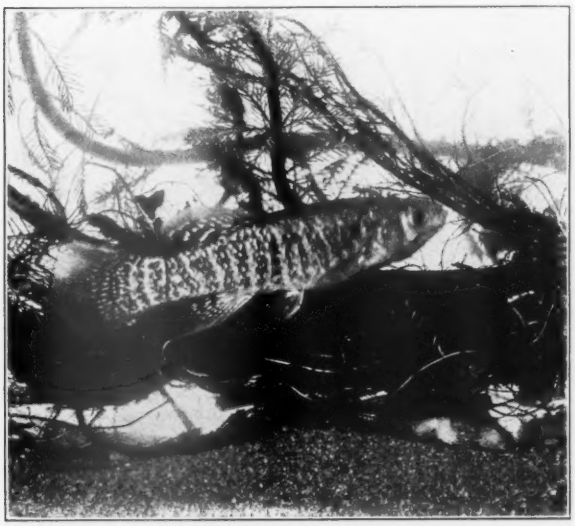
Should flowers be collected for an herbarium only, and the collector has no idea of photographing them, they may be conveniently carried from the field by simply placing them carefully between the leaves of good-sized magazines. Be very sure to see well to it that the chief parts of the flower—its stem, leaves, and other structures—are properly displayed for study when the plant is placed in the folio holder for the herbarium. The process has already been described by the writer in the pages of AMERICAN FORESTRY, a year or more ago.

As to the collecting of such insects as one may secure on

VIRGINIA SHORES OF THE POTOMAC RIVER, IMMEDIATELY BELOW CHAIN BRIDGE

Fig. 4. Opposite this point the District areas are low and very rocky, considerable timber occurring well back from the banks.

such trips, including moths and butterflies, the best way to do is to follow the instructions given in the works of some of our most competent entomologists—and there are a number of them. Perhaps one of the best of these



ONE OF THE PRETTY AND INTERESTING LITTLE MINNOWS TO BE CAUGHT IN THE POTOMAC

Fig. 5. In some localities these little fellows are known as "Killifishes," and are much sought after for bait by fishermen.

is to be found in the last chapter of Dr. L. O. Howard's work entitled "The Insect Book."

Nearly every large city has a naturalist's establishment, where the necessary outfit for collecting and preserving insects may be obtained. Such work is extremely interesting and important, not only for explorers and field naturalists generally, but for all well-informed foresters and experts on trees in general.

Apart from being a naturalist and explorer, it should be the pride of every efficient forester to collect, study, and rear specimens of every insect pest in the region where he is stationed, be this in the District of Columbia or elsewhere; that is to say, such insects or their larvæ as are in any way harmful to the trees of our forests. It is not a bad idea to devote one good-sized room in one's home to this work, wherein should be installed a special library; cases for the collections and specimen exhibits; vivaria for breeding insects, and the rest. A small studio for photographic purposes is a most useful if not necessary adjunct to such an establishment.

It goes without saying that one of the chief groups presented for study and observation—the one that has as great an interest for us as perhaps any other—are the birds of the region explored; and, as represented in the District of Columbia, the number and variety of species occurring during the vernal and autumnal migrations, as well as during the intervening seasons, is sufficiently great to occupy the time of any expert observer for the better part of every day in the week. For years past the economic ornithologists of the various bureaux connected with such work have collected large numbers of the different species of insect-eating birds for the sole purpose of examining the contents of their stomachs, in order to ascertain whether any particular species of insectivorous birds was inimical to man's agricultural or other interests, or the reverse. Many hundreds of our songsters have been sacrificed in that such information might be obtained and made permanent record of for the enlightenment of any one having use for it. It would seem that researches of this order have been carried far enough for all practical purposes; so that, at this time, the explorer may, in any section of the District of Columbia, when listening to the early morning chorus of bird songs in April, in the secluded parts of some piece of woods or other, eliminate the thought from his mind as to what the contents of the stomach of any species may be. Surely one may now listen to and enjoy the rich songs of our wood thrushes, our catbirds, and our many other avian songsters, without the ever-present "commercial" or "man's interest" idea being forever brought to mind.

There is plenty of work left for bird observers in the case of those who make explorations into the wilder parts of the District, aside from what most people regard as rather gruesome researches. The relative number of

A BIG SNAPPING TURTLE CAPTURED BY THE WRITER IN A CREEK CLOSE TO THE DISTRICT LINE

Fig. 6. This is a most dangerous and vicious representative of its tribe, and quite capable of inflicting a very serious bite.

species seen during the migration always furnishes interesting, not to say important, data for record. The increase or decrease of the enemies of birds is always worthy of investigation, as is likewise true of the dates of arrival and departure of the various species during the migrations. Sometimes it will be noted that a cer-

A BEAUTIFUL GROUP OF THE "GHOST PLANTS" OR INDIAN PIPE FOUND IN VARIOUS LOCALITIES IN THE DISTRICT

Fig. 7. This is one of our best-known parasitic plants, which obtains its sustenance either from roots or from decomposing vegetable matter. Note the Slimy Salamander in the shadow in the foreground.

tain species will put in an appearance in undue numbers for some cause or other, and that cause should be carefully investigated. An example of this was seen during last winter (1919-20), when a large number of common crossbills—a typical northern species—suddenly appeared in certain parts of the District. It distinctly pointed to what was soon realized: an unusually severe winter, with much snow. Surely the crossbills made no mistake in coming a little further south during the season in question.

When birds are markedly scarce during some years, we may often note a corresponding increase in the numbers of certain insects upon which those birds feed. A certain species of butterfly suddenly appeared in undue quantities—possibly for the reason that the species of bird that usually fed upon its larvæ was was not represented in sufficient force to destroy it and keep it down. The entire matter of the balancing of forces of this character may thus be studied, and the causes for the equipoise, or destroying the normal equilibrium in nature, as accounted for by the abundance or the reverse of certain animal groups, may be systematically considered.

Opportunities to study the nests and eggs of many species of birds, both water and land forms, are, to some extent, fairly good in the District. Certain marsh birds breed in the less frequented sections along the Potomac and Anacostia rivers—some species quite abundantly, as Marsh Wrens, Redwings, Rails, Waders, Sandpipers and others. Notwithstanding the number of times the nests and eggs of such forms have been described and photographed, good work along these lines is always both desirable and acceptable. Occasionally it requires not a little skill and patience to be thoroughly successful. The writer well remembers the experience he passed through, many years ago, when he secured, upon a sultry summer's day, a photograph of the nest which a pair of Marsh Wrens had built in a cat-tail swamp, where the mud was knee deep in some places. It required an entire forenoon to accomplish the object, which, in the end, was wholly successful. When undertaking such work, it is well to have a tripod with very long legs.

If the explorer is very fortunate, he will sometimes find certain birds breeding in unusual places; he should then put forth his best efforts to secure the very finest

A FINE SPECIMEN OF THE SPINY SWIFT, WHICH IS QUITE ABUNDANT IN THE DISTRICT OF COLUMBIA

Fig. 8. It is quite harmless. Examples are met with having a length of seven inches, the males being of a brilliant azure blue on the sides, bordered with black.

photographic results. An excellent example of this would be to obtain a good negative, as nearly natural size as possible, of, say, the nest of the Maryland Yellow-throat, where the birds had selected the

interior of the spathe of a skunk cabbage to build in.

Last September the writer collected between thirty and forty different varieties of toadstools and other fungi, within the range of a quarter of a mile from his home on Eighteenth street in Washington. These were all photographed natural size, and made a truly wonderful series of pictures. Later on they will be published with appropriate text; for it is really extraordinary how little is generally known of these growths, familiar as they are to many, in the places where they occur so abundantly

CRICKET FROGS OR "PEEPERS" ARE AMONG THE VERY EARLIEST HARBINGERS OF SPRING.

Fig. 9. This pair was captured along the marshy banks of a stream, where the species was quite abundant. In the early days of April the chirrupings of these little creatures have a charm for all of us.

within the District line; they make very charming subjects for photography when artistically taken. Then, too, they have a distinct value in other directions, not the least so to those foresters who have their homes *in the forests,* and who desire to draw when they can upon what the forest affords in the way of food. Mushrooms make an excellent dish for a change; but the dread of collecting the poisonous and even unwholesome species for the purpose deters hundreds of people—our foresters among them—from gathering them for the table.

Perhaps one of the most interesting studies for the explorer in the District of Columbia is offered on the part of the trees of its woods. Aside from the typical shrubs, there is a fine array of trees constituting the timbered parts of this domain. Much as dendrologists know of our trees, systematic studies of them as they occur in certain regions are always useful, and if the work is done scientifically and thoroughly, one can never tell of what economic importance it may prove to be in the outcome. One should start a series of good-sized albums in which to preserve the photographs made as part of the work. Here should be preserved photographs of isolated trees of all descriptions found in the area explored. Trees, as they constitute forests, should also be photographed; and this sort of work ought not to be confined to any particular part of the year, for a *leafless* tree, photographed in mid-winter, has a distinct value that a tree in full foliage does not possess. It exhibits the *real form* of the tree, and the arrangement and growth of its branches and twigs. Special parts of trees should also be abundantly photographed, as the character of the leaves and their variations; the bark and the several forms it takes on. Particular attention should be given to the flowers and fruit of the trees, and, when possible, the *plan of growth* of their roots. One of the best ways to secure a photograph of a normal root of any tree is to select one where the wind has blown it down and the rain has washed all the earth or soil from its roots. If such a tree has grown well away from others, in soft soil containing no rocks or cobbles or foreign bodies of any sort, and was advantageously placed as it fell, its root, with all of its rootlets, would, in many instances, offer an example of the *normal* growth of that species of tree. It is truly surprising how the roots of various species of trees differ. One of their most remarkable features is their outline, some trees having roots that sink down deep into the earth and branch in all directions, while others occupy almost entirely a space in the horizontal plane.

NEST AND EGGS OF THE WHITE-EYED VIREO

Fig. 10. This bird is one of our liveliest little songsters in the early days of spring, and its well-woven nests may frequently be seen on the twigs of bushes during the following winter.

It is often remarkable to note how little hold upon the earth some trees have through the media of their roots.

One frequently sees, for example, some enormous pine blown down during a severe gale. It is stretched out upon the ground for its entire length, with its roots more or less exposed. The latter are very often seen to be by no means extensive—in proportion to the size of the tree—nor did they by any means sink deep into the earth during its life; the wonder is that the tree did not blow

ONE OF THE PRETTIEST LITTLE BUTTERFLIES OCCURRING IN THIS REGION; IT IS KNOWN AS THE BUCKEYE

Fig. 11. During some seasons this species is quite rare, while at others it may be wonderfully abundant, more particularly in the South.

down before. Other species of trees have enormous roots that branch below ground in all directions. As a matter of fact, it is a very interesting study to carefully consider all that the roots of trees present, and the forester should allow no opportunity to pass whereby our knowledge of such a subject may be augmented.

## NUT TREES FOR ROADS AND PARKS

MAPLES, poplars, elms, willows and the ailanthus are seen along roadways and in parks wherever public ambition for shade has been sufficient in degree to induce authorities to put in trees of one sort or another. For the most part our northern highways are unshaded except by such trees as may accidentally spring up by the roadside, and, after competition with various enemies, finally reach above the fences, writes Robert T. Morris, a member of the American Forestry Association of Washington, in the *American City* on "Nut Trees for Roads and Parks." Trees for city roads and parks, particularly in the larger cities, are often enough selected by some nurseryman favored by the political powers that be, and the nurseryman furnishes what he wishes to supply to the uncritical purchaser. The time for this sort of procedure is passing, and people are beginning to awaken on the subject.

Progress in civilization along this line will mean that we are gradually to dispose of the kind of trees that furnish nothing but bunches of leaves which in due season litter the ground and when swept up contain nothing more than incidental trash. Now, if these trees were to give place to nut trees and fruit trees, there would be very much besides leaves to be swept up in the autumn. One of my friends in Illinois told me that in 1918 he received $8 per bushel for his black walnuts of a particularly good kind, and that some of the trees bore as many as 14 bushels to the tree.

Suppose that we were to supplant willows and poplars along the roadside with trees which would give us bushels of product worth many dollars per bushel when the leaves were swept up in the fall. It is no more difficult to set out a black walnut than it is to set out a willow or poplar. The first cost is no greater if we set out seedling trees, although, if particularly good kinds of grafted black walnut are set out, the first cost is something more—yet negligible in view of the return. Investment in a nut tree differs from an investment in an industrial enterprise, for the reason that the plant of the industrial enterprise is decreasing in value from wear and tear the moment after it is completed. A nut tree, on the other hand, is increasing in value from the moment it is set out.

## HALF THE BALSAM KILLED

CONSUMERS of print paper in this country say they are between the devil and the deep sea. Consumption has so far outstripped production that prices of paper have mounted to undreamed of heights. Many newspapers have been forced to suspend publication and others have been consolidated, while most of the big dailies are trying to conserve by reducing the number of their pages. The pinch of the paper famine is everywhere felt.

The Weekly News Letter of the United States Department of Agriculture says that two alternatives present themselves in the emergency: "The country must depend increasingly upon Canada," it says, "eventually abandoning many of its own mills, or the nation's policy with regard to its private forests must be radically changed. Of all supplies of paper, wood and pulp used by the United States about one-third now comes from Canada."

The tree known as Canada balsam or fir in Canada and the Eastern United States has come to be regarded as second only to spruce as a source of wood pulp. A very large proportion of the balsam of all of Eastern Canada and of districts in the State of Maine is either dying or dead. Canada's contribution of pulp and paper to the States is likely, therefore, to decline heavily in the next few years. Already there is said to be a movement in Canada to prohibit the exportation of pulp wood to the United States.

S. A. Graham, of the University of Minnesota, spent six months in the woods of Quebec and New Brunswick last year as a special field investigator of the Entomo-

logical Branch of the Canadian Department of Agriculture. He traveled 400 miles by canoe in Quebec and 125 miles on foot in New Brunswick in addition to other less extensive trips. He and his associates went to study the tragedy of the balsam and he has now made his report to Dr. J. M. Swaine, of Ottawa, chief of the Division of Forest Insects in Canada.

Mr. Graham found that the balsam had been destroyed indirectly by the lumbermen and directly by the balsam or spruce bud moth. Under the methods of logging employed, the balsam, which was looked down upon by the lumbermen when pine and spruce were to be had, was left standing until large districts contained little else than balsam or fir.

For a time the balsam in its isolation prospered mightily, but eventually its wonderful prosperity led to its downfall. A native insect, which under ordinary conditions causes but little damage, bred up to such large numbers when its natural food, the foliage of the balsam, appeared in such abundance, that it forthwith proceeded to defoliate and then to destroy the great forests of balsam which stretched for scores and scores of miles in the wilderness of Quebec and New Brunswick. Not until most of the dominant balsam had been destroyed, when, in other words, the bud worms had eaten themselves out of house and home, did the destruction cease. Then followed secondary insects, various kinds of bark beetles, which attacked and killed thousands of trees already weakened by the onslaught of the bud worn. These beetles breed in fresh slashings and in order to control them a general policy of slash burning has been recommended by the Division of Forest Insects.

Balsam deteriorates so rapidly that only a very small fraction of the dead or dying timber can be salvaged and used for pulp. This work is being carried forward on a large scale in New Brunswick, but the time is close at hand when no further shipments of "dead and down" can be made to the mills. When this time comes and the supply of commercial balsam is reduced to the minimum, then Canada's contribution of one-third of the supplies of paper, wood and pulp which are used by the United States will be materially reduced.

"More than 50 per cent of the balsam in Quebec has been killed," says Mr. Graham. "The only balsam trees remaining on extensive areas are the young reproduction and those which are growing in the shade of other trees. The earliest bud worm outbreak began in 1909 or 1910 on the headwaters of the Dumoine, Black, Coulogne and Gatineau rivers. This region became a great nursery where the pest reached its maximum concentration and from which it spread eastward into lands largely denuded of its timber except for the balsam. It was thus that the lumbermen had paved the way for the insect.

"The outbreak is over because the available food supply of the insect has been used up on large areas. It is probable that very little balsam is left except in the southern part of the province. With a large part of the available spruce cut, and the mills dependent more and more upon balsam for their future supply of pulpwood, this condition is a veritable catastrophe. The damage has been done and there is no immediate remedy."

Mr. Graham points out, however, that the widespread destruction of the Canadian balsam will have some recompense. "It it nature's remedy," he says, "of bringing the forest back from a condition of instability to a safer and more stable condition. The proportion of balsam in the stands has been reduced, while other species of trees have increased in like ratio."

The need of a constructive forest policy has been brought home to the lumber interests and to officials and specialists of Canada.

In the end the general forestry conditions may be greatly improved as a sequel of the raid on the balsams by the budworm, but for many years to come the loss will bear heavily on consumers of pulp and paper.

## GERMAN FORESTS STILL GREAT ASSET

THAT the famous and well-tended State forests of Germany figure importantly in the industrial and economic rehabilitation of that country seems evident from recent information received by Gordon Dorrance, of New York, a member of the American Forestry Association, from Dr. Carl Alvin Schenck, of Hesse-Darmstadt, for 15 years famous in this country as the founder of the Biltmore School, and a forester of recognized rank in America not less than abroad.

Doctor Schenck declares that "German forests continue an A-1 asset. Our forest policy has been a conservative one, as you know. It reaps today what it has planted. Were it not for our forests the coal situation would be critical in the extreme. There is no coal whatsoever to be had for my house at Darmstadt; here in Lindenfels I have wood and some coke, enough for the time being.

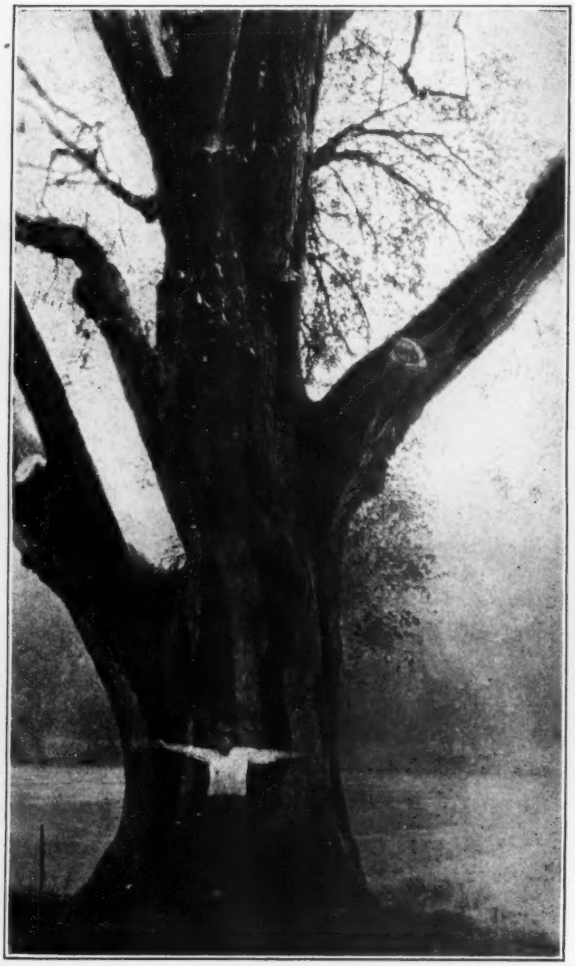
"We require better economic conditions, safer than those now prevailing with reference to food and living. If our crops fail in 1920 there will be a disaster, a catastrophe by which the Black Plague of London is a million times repeated. Unfortunately, chances for reasonably good crops are few, and slight. There is no sugar to be had today; not an egg for the sick; no meat, of course—except for the rich and the very rich. Wages are high, but you cannot buy that thing for a stiff price which is not in any market.

"Our present forest policy continues to be conservative—much too conservative for me. If there were ever a time to empty a saving's box, that day has now arrived. Where the forests stand on farm soil they might well be converted into farms, although the authorities do not seem to approve of the change. Many of our forests might be thinned out twice as heavily as is customary, but the forester does not care to abandon the old practices.

"The price of forest products is high—in paper money. Spruce logs sell in the woods, 15 miles from the nearest railroad, at 2,000 marks per 1,000 board feet. Timber fit for furniture is beyond the reach of anyone. Nevertheless, the forest authorities do not cut more than the 'sustainable yield'—or as much as is replaced by our annual growth."

# "HALL OF FAME" FOR TREES

*What is probably the only tree in the world with a self watering apparatus provided by nature is the famous elm on the farm of J. Fred Johnson, near Kingston, Tennessee. There is a spring at the roots of the tree and as its age is estimated at between four and five hundred years, State Forester Maddox, of Tennessee, credits this long life to the spring. French explorers wrote of the tree in 1790 and said its circumference was twenty-two feet, which helps Forester Maddox to estimate its age for the American Forestry*



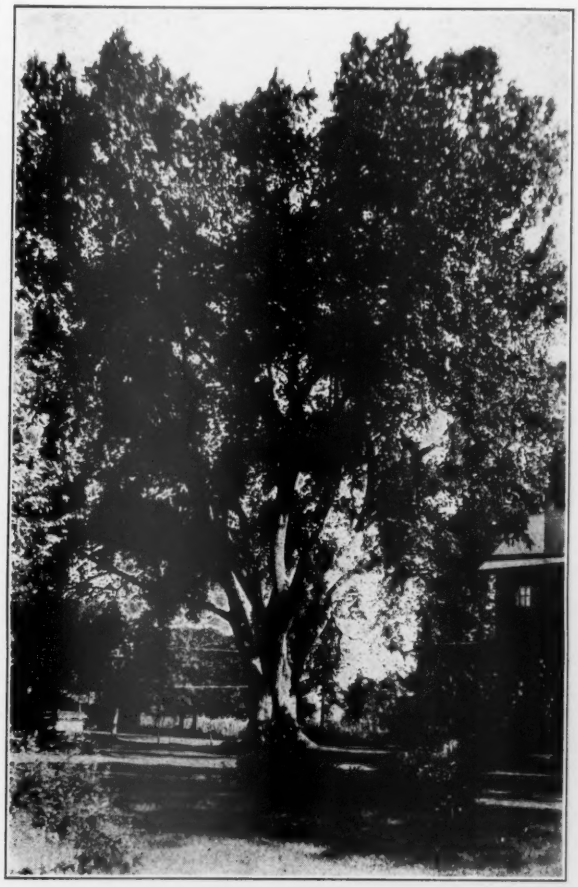
*Association, of Washington. The circumference is now twenty-five feet and it has a spread of 150 feet. Some time ago it was thought to be diseased and Governor Roberts directed Forester Maddox to treat it. The tree is now going along nicely and seems destined to see another four or five hundred years. Mr. Johnson claims the tree is the largest of its kind in the world.*

*Called the largest Acacia in the country, this tree has been entered in the Hall of Fame of the American Forestry Association at Washington. Is there a famous tree in your town? This tree was nominated for the "Who's Who" by G. W. Weakly, of Dayton. The tree is on the property of O. I. Gunkel and it stood in seventeen feet of water during the Dayton flood. The*

*oldest inhabitant of Dayton cannot remember when the tree was any smaller than it is now. The diameter is three feet six inches and the circumference is twelve feet six inches. The American Forestry Association is anxious to find trees with a history as well as trees of unusual size.*

# "HALL OF FAME" FOR TREES

*Claiming it to be the most beautiful elm in the United States, John Kaiser nominates the Rathbone Elm, at Marietta, Ohio, for a place in the Hall of Fame for Trees. This tree has a circumference of 27 feet at three and one-half feet above the ground, and a circumference of 32 feet one and one-half feet above the ground. Of the five largest branches, Miss Waldine Rathbone informs the Association that the smallest*



*has a circumference of ten feet. The age of the tree is estimated to be close to 700 years by experts who have examined it. There have been many nominations for the Hall of Fame from Ohio, such as the Logan Elm, which marks the spot where a treaty of peace was made with the Indians at which time Logan, the Indian chief, made the oration now considered a classic.*

*This tree had its head shot off during a Fourth of July celebration in 1832. It is a memorial of the day and is now cared for by Spartanburg, South Carolina. The tree has been entered for a place in the Hall of*

*Fame of the American Forestry Association by John B. Cleveland. The tree is three feet in diameter, and during the nullification excitement a large union meeting was held on July 4, 1832. A cannon was loaded with leaves and twigs and without thinking of the aim the charge was let go. It was not high enough to miss the tree and the entire top was torn off. The tree is thirty feet high as it stands now.*

# A DAY WITH THE DUCKS ON LAKE CAYUGA

BY A. A. ALLEN, PH. D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

IT was seven below zero when we left the house and it had not warmed up a bit when we stepped from the train at the flag station at Willets and made our way to the blind on Long Point. It felt like a good day for ducks and the prospects for the day's hunt were excellent. For twenty miles the train had followed the shore of the lake, and, though the mist rising from the lake had obscured everything more than a hundred yards from shore, we had seen enough to know that the ducks were moving and that the canvasbacks had been frozen out of their best feeding ground at the north end of the lake. We therefore lost no time in traversing the long mile from the station to the blind and were soon tossing out the decoys. A stiff wind was blowing from the north, row after row of white caps were visible off the end of the point and a good surf was pounding on the north side. The moderately quiet water on the south side was, therefore, the place for the decoys and before long, we had two dozen male canvasbacks bobbing away at the left and an equal number of mixed female canvasbacks and bluebills at the right. It was difficult to keep our attention fixed on chipping the ice, which clung to the decoys from previous usage, and getting them all put out, when every once in a while some member of the party would call out, "get down," in the hope that a flock of ducks, that was seen coming, might fly close enough to the point to afford a shot. We were so conspicuous, however, on the bare gravel that though they were often headed straight for us, they always shied off before coming in range.

LARGEST OF THE DUCKS

The canvasback, in good condition, weighs 3½ pounds, but the black ducks often weigh four, and one exceptional individual weighed four pounds and eleven ounces.

The blind, as all of the shooting stands are called in this part of the country, was a box sunk in the gravel of the end of the point to such a depth that, when one sat in it, only his head and shoulders were above the level of the ground. A little gravel piled up behind the box and a few willow branches completed the deception and rendered one almost invisible so long as he remained motionless. When the point is covered with snow, white coats and hats are necessary to be really inconspicuous. The box had a low seat, was roomy enough for one to stretch out his feet, and held three men comfortably. I say comfortably, but no blind was ever invented that was comfortable on a cold day. The comfort has to come entirely from within, but it is strange how quickly one can change from a half-frozen, stiff, rheumatic, clod to a warm, mobile, energetic, human being at the mere sight of a flock of ducks directing their way toward the stools.

A PROMISING DAY FOR DUCKS

Low temperature, cloudy skies, and moderately strong winds make them fly the best. This is the beginning of the days sport—tossing out the decoys.

On this particular morning we had plenty of opportunities for observing this because by the time we were safely ensconced in the blind, it was after nine o'clock and the morning flight seemed to be over. The wind died down, the steam from the lake hung heavily over the decoys, sometimes almost hiding them from sight, and the ducks just seemed to stop flying. At least they did not come close enough so that we could see them through the mist. For fully an hour we sat there without seeing a duck. Occasionally a lone herring gull would sail by close enough to give

us a start for, if anything looks like two ducks in the distance, it is one herring gull coming head on. The black tips to the wings are the right distance apart and have just the right motion to suggest a pair of ducks, still far away but headed right for one. Earlier in the season the kingfishers fool one, but their resemblance

THE LAKE IS MUCH WARMER THAN THE AIR

Vapor rising conceals everything but the foreground and the decoys. A little more wind and it would be a perfect day for ducks.

to ducks is due to their actual size and shape and their method of flight while that of the gull is entirely a delusion. At another time we were startled by a swish of wings overhead and glanced up to see a black crow sail over from behind and start to alight on the shore in

SEVEN BELOW ZERO BUT EVERYONE HAPPY

Steam rising from the lake and drifting over the point obscures everything. One dared not close his eyes lest his eyelashes freeze together, and one scarcely dared to smile lest his face crack, but what did it matter if the ducks were flying?

front of us. It is always a good test of the inconspicuousness of a blind to have the crows come thus close, so we felt that at least we were not scaring the ducks away.

The icy mist was wafted over the point and froze to our gun barrels. It covered our heads with frost until white hats were almost unnecessary, and it formed crusts on your eyebrows. One dared not close his eyes lest his eye lashes freeze together, and dared scarcely to smile lest his face crack. All the extra layers of clothing and heavy socks seemed of no avail; we were gradually getting numb. Suddenly Sam exclaimed, "Here they come," and three faint black specks appeared in the south. "Art, you take the one on the right, Claude, you the middle, and I will take the one on the left. Let that be our program for the whole day and we won't be shooting at the same birds." On they came, the black specks rapidly growing larger, developing wings, and the form of ducks. Soon their blocky heads could be made out, conspicuous tails, and finally large white patches in their wings. "Whistlers," Same exclaimed in disgust, "they'll not come to our stools." Sure enough they passed the point out of range and never even bent their flight to look at the decoys. Early in the season the young whistlers or golden-eyes "stool" very readily to almost any sort of decoys but the winter birds become exceedingly wary and usually will not look at anything

AFTER THE SEASON CLOSES

Canvasbacks feeding close to the shore upon grain that has been put out for them.

but their own kind. One has greater success in hunting them with two or three decoys, somewhere along the shore where they feed, than with a large number on the points. They are inferior ducks for the table, however, especially late in the season when they become quite fishy in flavor, so that it does not pay to hunt them when better varieties are available. The passing of these three ducks, however, served to start our circulations and we were ready when Sam espied five more coming a little closer shore than the three that had passed. These had the same open formation of flight, and, though we could as yet not even make out the shape of their silhouettes, we surmised that they also were whistlers. If they kept to the line they were following, they would pass directly over the blind so this brought up the question, "Do we shoot whistlers?" "A duck is a duck until we each get one," replied Sam. "Let them have it." They were coming like the wind and in a thrice they were in range, over the decoys and headed for the blind not twenty yards

in the air. BANG, the shots rang out as one, and two of the handsome ducks spilled from the flock, "Who missed?" Sam looked rather sheepish and admitted that he had not fired. Ice had frozen his safety tight so that he could not pull the trigger. "If I'd only known you were not going to shoot," said Claude, "I would have shot another one for you." Further argument was checked by the appearance of a slender black thread in the distance above the mist. "Canvasbacks!" we exclaimed simultaneously," and headed right for us." Blacker and longer became the thread, stretched at right angles to the line of flight. Soon it broke up into a row of little black dots and we were busily counting them as they rose and fell, keeping ever in their line formation, three hundred, if there was one. Not a muscle did we move as they approached, the rhythmic movement of their wings seeming to keep time with our heart beats. "Too high, don't shoot," came in muffled tones from the generalissimo. We dared not turn to watch them as they passed directly over the decoys and then over our heads, their wings making music known only to the wild fowler. Once over we all turned to watch and see if any of them would be lured by the magic of the decoys. It is exceedingly unusual to have such a large flock come to decoys but often some of them will break away and come back. We had seen a few of them waver and crane their necks as they passed over and sure enough, they had flown less than a quarter of a mile when fifteen of them dropped from the flock, made a big circle over the lake and headed again for the decoys. Once more they were too high and we decided to let them pass. When they were almost directly over the decoys, however, they made one of their spectacular drops, we might almost say dives, for the lake and the decoys. With arched wings, they rocked first to one side and then to the other until instead of passing two hundred feet over our heads they passed barely twenty. Of course we were not ready to shoot, and we feared that they had seen us and would not circle again, but quickening their wing strokes as they barely skimmed the water north of the point, they made one more big circle over the lake and headed straight for the stools on set wings. If excitement ever claims the physical being of a man, it is at just this moment when he fears the birds will discover the delusion before they get in range and leave without giving him a chance to test his skill. "Remember your positions and choose your birds. Don't shoot until they are in range—NOW," came the orders. Bang, bang. Six shots rang out almost as two. At the first round three birds dropped, at the second but one. It is easy to pick your bird for the first shot, but for the second, instinct compels one to shoot at the nearest one, and as a result, we all fired at the same bird though there were eleven others within easy range. Four birds had dropped but as we now looked over the lake only two were visible. All of the diving ducks have a great deal of vitality and unless killed stone dead at the first shot usually dive when they hit the water and frequently get away. So we jumped from the blind to be ready for them when they should come up, for one cannot bear to let crippled ducks get away as the majority starve to death. When a crippled duck comes to the surface it usually swims very low against the water, sometimes

THE COLDEST PART OF THE DAY

Taking up the decoys is always cold work, for the hands because the wet anchor ropes soak one's gloves unless the temperature is low enough to immediately freeze the ropes upon exposure to the air.

TWO NICE BRACE OF CANVASBACKS

The most delicious and most highly esteemed of all the water fowl.

with only its bill protruding and is very difficult to hit in a vital spot. Three more shots were required to despatch one of the cripples and though three more were fired at the fourth duck, it finally got out of range of the shore and a lively chase ensued with the boat before we finally secured it. By the time we tumbled back into the blind, we had forgotten all about its being seven below zero, for we had worked hastily, and this, together with the excitement, caused by the numerous flocks of ducks that had flown by while we were out of the blind, caused us to feel that it was mid-summer. It is strange but it always seems to be so that the ducks fly best when one is putting out the decoys, when he is taking them up, or when he is out on the lake chasing a cripple. It was thus all day long. Occasionally we had to row out to the decoys to break off the ice which formed around them or to pick up one that had broken loose, and even if we had not seen a duck for an hour before, some always flew in close at such times and made us feel sorry that we had left the blind.

We sat in the blind talking things over and watching a bald eagle that had followed up the shore and perched in a dead elm near the base of the point when five more ducks were spied flying close against the water. At a distance they looked more like swallows than ducks for all one could make out was their rapidly moving black wings. As they came closer we could discern their white heads and long tails and we knew that they were old squaws. No self-respecting hunter shoots an old squaw any more than he would a merganser, for both are so fishy that they are impossible subjects for a white man's table. I desired a specimen of a nice old male in full winter plumage, however, to mount for the museum, and so I told Sam that, inasmuch as he had not fired at the whistlers, he could pick out the nicest bird from this flock as they went by and I would give him the body, after I had skinned it. We knew that they would not look at the decoys but their line of flight promised to bring them within long gun shot of the point. Almost any duck hunter is glad to shoot at an undesirable duck if he knows it is going to be utilized, so, as they swung by the point, Sam picked his bird and fired. "Well, I'll be good and thoroughly switched," exclaimed Claude. "All five at one shot; what sort of a game hog are you?" Sure enough, at the discharge of the gun, all five of the old squaws hit the water with a big splash. But they didn't stop going, and, to all appearances, they did not stop beating their wings, for when they came up again, far out of range, every one of them was flying as fast as when the shot was fired. The old squaws are strange ducks, and, especially in the spring during the courting season, go through many unusual maneuvers, chasing one another about, plunging into the water from a considerable height, playing and gambling like so many children. They are great divers, too, and are often caught in gill nets set for white fish in 150 feet of water.

Soon after the old squaws, came two canvasbacks that would have passed far out of range without looking at the decoys, but a low guttural note from the wooden "duck call" caused one of them to veer and swing close enough so that a long shot pulled it down. Another pair behaved much the same way only this time both of them came in range and both were added to the bag. Then came a great mass of ducks flying in close formation, low against the water. Redheads, was our guess while they were still so far off that even the individuals of the flock could not be made out, and sure enough, as they came closer, we could make out their dark forms, resembling bluebills much more than canvasbacks, but without any white in the wings. There were at least five hundred in the flock and though they came close enough for us to make out the red heads of the males, we had no hopes of their turning in to the decoys and they passed undisturbed. Earlier in the season redheads decoy very well to their own kind or to bluebill and canvasback decoys, but by the time winter sets in, it is only stray singles or pairs that will look at any decoys. They are clannish ducks and spend most of their time in compact "rafts" over beds of musk grass (Chara), and while with us are quite inferior to the canvasbacks. Indeed on Cayuga Lake the canvasback lives up to its reputation and excells all the other species. Of the diving ducks, bluebills and redheads are next in quality, and about on a par with each other. The canvasback is the largest also, with the exception of the black duck, and when in good condition weighs three and a half pounds or even somewhat more, while the redheads rarely tip the scales at three pounds, and the best bluebills weigh two and three-quarters. The largest bluebill I have ever seen, weighed an even three pounds and it was so fat that, when plucked, its legs appeared as mere bumps protruding slightly from the otherwise oval body. The black ducks, which winter on the lake, are much larger than those that pass through earlier, and by many persons are supposed to represent a different sub-species called the "red-legged black duck." Many individuals weigh as much as four pounds and one exceptional duck, taken in November of 1914, weighed four pounds and eleven ounces. The whistlers are the

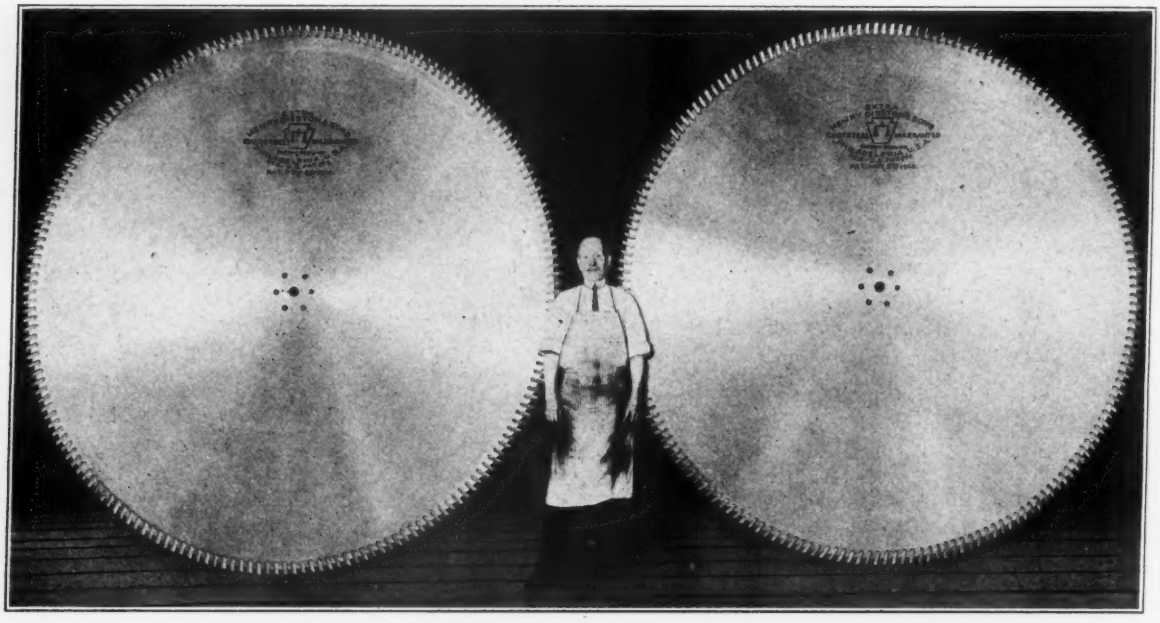
AT THE CLOSE OF A GOOD DAY'S SPORT

Nine canvasbacks, two bluebills and two whistlers. The law allows 25 to the individual or forty to the blind, but only "game hogs" kill that many.

same sizes as the bluebills, averaging between two and a half and two and three-quarter pounds.

But to return to our duck blind; the wind had risen again and was now blowing a gale from the north. The mist had cleared somewhat but the rollers were piling in so that we knew it would be impossible to go out in the little boat beyond the shelter of the point. We refused to shoot ducks that we could not retrieve so we resolved to shoot none that would not fall either in the shelter of the point or far enough inshore to the north so that they would drift ashore. No sooner had we made this decision than the ducks began to fly thick and fast, apparently stirred up by the quickening of the wind. For every one that passed within the shelter of the point or inshore to the north, there were ten that passed within easy range outside of the point, such that if killed they would have drifted down the middle of the lake. Before the sun got low in the sky, however, we managed to secure two more canvasbacks and two bluebills, making thirteen ducks in all, and we were ready to call it a good day's sport. If we were to judge by the bag limit, set by law, as to what constitutes a good day's sport, we would have had to acknowledge that we had just begun, for the law allows twenty-five to the individual or forty to the blind. Thank fortune, however, though the law may encourage a man to make a "hog" of himself when the opportunity offers, it cannot control his standards of a good time, and we did not feel that we had to carry home over a hundred pounds of ducks in order to say that we had had a good shoot.

Some day our children or children's children will ask what we did with the twenty-five ducks that the law allowed us to kill in one day and they will wonder why we did not let a few more of them live so that they could get an occasional shot at a real wild duck instead of at those raised in captivity and released. Some of us will feel quite ashamed of the age in which we spent our youth and will try to explain it away, but others of us will have to admit "It's history, my son; wild ducks, wild pigeons, wild bisons, are history, first come, first served."



## THE LARGEST SAWS IN THE WORLD

**HENRY DISSTON & SONS, INC., of Philadelphia, have recently finished two of the largest circular saws ever made. They are of the spiral inserted tooth type, and are to be used by a well-known concern in the Far West for cutting shingle blocks from the large trees of that section. Each of the new saws measures 108 inches (9 feet) in diameter, and in the rim are inserted 190 teeth. One may gain some idea of so tremendous a saw by comparing it with a 54-inch saw, which requires for its making an ingot of steel weighing approximately 180 pounds and its weight when finished is about 125 pounds. The 108-inch saw started out as an ingot weighing 1,140 pounds, and after reheating, rolling and trimming the remaining weight was about 795 pounds. In size a 54-inch saw is apparently just half that of the 108-inch one, but actually the 108-inch is four times the size of the former, as a measurement of square inches of surface will show. In the making of large circular saws Henry Disston & Sons have had long experience. As long ago as 1876 they made one 100 inches in diameter for exhibition purposes. Some years after they made another 100-inch saw for cutting stone, each tooth of which was studded with a black diamond to give the necessary cutting edge.**

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### BIG ARBOR DAY PLANTING

APRIL 9, 1920, fixed as Arbor Day by proclamation of the Governor of Maryland, witnessed a remarkable outpouring of the school children of Baltimore into the city's parks. About eight thousand boys and girls sealed their interest in public parks and trees by tree planting ceremonies, which took place in practically every park and public square in the city. Of the five hundred trees planted, each school planted and dedicated at least one.

The species chosen for planting were white oak, pin oak, red oak, black oak, mossy-cup oak, Norway maple, sugar maple, American elm, American linden, Oriental plane, white birch, red dogwood and Lombardy poplars.

The plan was worked out by the Park Board, with the hearty co-operation of the school authorities. Every member of the Park Board is a lover of trees—Mr. J. Cookman Boyd, the president, being particularly interested in the preservation of old trees as well as in replacement in cases of unavoidable loss. Hundreds of park trees are lost annually—torn by heavy winds, uprooted, shattered by lightning or a prey to blight or disease and sometimes victims of smoke and gases. The Board hopes that such replanting by the public school children of Baltimore will become an annual Arbor Day event, such occasions offering splendid opportunity for special instruction upon the necessity of tree growth to human life. The planting in the parks and squares, in which children take an active part, has splendid educational value in that it stimulates in children a serious and personal interest in tree life and growth, as well as in the park system. The trees they plant will grow up with them and their enjoyment of the parks will always hold pleasant personal memories for them. As it is the next generation which will benefit from such tree planting, it is most appropriate that it should be done by the school children of today. Baltimore's Park Board is to be commended for this fine achievement in tree planting.

### ARBOR DAY FOR CHINA

THE College of Agriculture and Forestry at Nanking, China, is starting a movement that has as its ultimate purpose the reforestation of China's denuded hills by inducing all of the schools of the country, Chinese and foreign, to observe a Chinese national Arbor Day. Addresses have been sent out in English and Chinese to the schools of the country urging that an Arbor Day holiday be instituted and giving instruction in tree planting methods. It is intended also to supply seeds to the schools.

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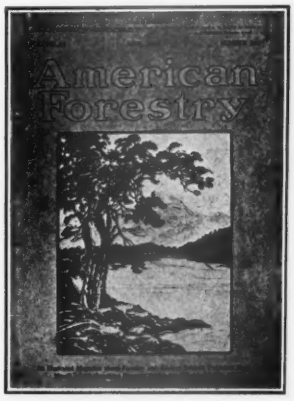


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# CANADIAN DEPARTMENT

BY ELLWOOD WILSON

PRESIDENT, CANADIAN SOCIETY OF FOREST ENGINEERS

DURING the months of October, November and December, a co-operative experiment was carried out by the Commission of Conservation, and the Logging and Forestry Departments of the Laurentide Company, Ltd., under the direction of R. W. Lyons, to determine as accurately as possible what it costs to burn the limbs and tops of conifers on an ordinary logging operation. A camp was built about one-half mile from the nearest point on the experimental plot which contains approximately 175 acres. This had been cut over for white pine some years ago and was made up of the following types: spruce-balsam slope 27 per cent, black spruce swamp 11 per cent, balsam-spruce ridge 57 per cent, and softwood-hardwood slope 5 per cent. The tract as a whole sloped gently down to a swamp in the center. The timber is generally mature and over-mature in the 90 year age class and there is present much evidence of the damage of insects and fungi. In the order of their presence the species are, balsam, white spruce, black spruce, yellow birch, white birch and white pine. Balsam formed about 64 per cent of the stand and was younger and smaller than the spruce. The large trees were unsound, particularly on the ridges and in mixture with hardwoods. The largest balsam cut was 16 inches in diameter and 70 feet high. There was much wind damage.

The white spruce was not abundant but had long clear boles and long compact crowns. Some had attained a height of 80 feet and a diameter of 22 inches and were from 100 to 130 years of age.

The black spruce formed the stand in swampy place but reached its best growth on the higher ground, 60 feet, and a diameter of 13 inches. The trees were limby and the growth was decidedly slow. Reproduction on the tract was mostly balsam in thickets where wind thrown trees had left openings.

French-Canadian labor was used, the men receiving eighty dollars per month and board, but even at this figure were hard to keep. Camp conditions were a little above the average.

Clean cutting of the conifers in strips was the method of cutting. The strips were from one to three chains wide and between them timber was left uncut for a width of two chains. They were run at right angles to the prevailing winds. The slash on each alternate strip cut was burned. All logs were taken down to three inches in diameter except on a small section where the logs below four inches were left in order to see what the waste, utilizing to that diameter would amount to. These tops were measured and counted and the number of four foot pieces they would make recorded and calculated in cords.

The skidding was done by the Logging Department and charges for men's time, horse time and board were made against the operation.

A total of 14,588 thirteen and a half foot logs was cut amounting to 500.2 cords or 245,288 board feet, Quebec scale. The brush from 172.1 cords was burnt, an extra man being used for two felling crews. The average cost per cord for the operation where the brush was not burnt was $2.94 per cord, exclusive of skidding. Where the brush was burnt $3.46, so that the average cost of burning brush was $1.15 per cord or $2.30 per thousand feet.

The average distance skidded was about 250 feet with a maximum of 550 feet.

The costs are summarized as follows:

| | *per cord* | *per M* |
|---|---|---|
| Felling, limbing and brush burning | $1.93 | $3.81 |
| Skidding | 2.59 | 5.07 |
| Improvements | .16 | .31 |
| Depreciation | .18 | .36 |
| Transportation of men into woods | .07 | .14 |
| Supervision | .49 | .96 |
| Board | 1.44 | 2.82 |
| Totals | $6.87 | $13.47 |

The price per cord for this operation is no higher than for ordinary operations of like character and had the skidding been under the control of the man in charge the cost would have been reduced. The charge for supervision is very high as one trained man spent all his time on it. Had he been in charge of a whole district this item would have been very materially reduced. It is doubtful if the cost for burning could be reduced as the men who did the work had been previously accustomed to burn their debris. The question of whether it will pay to burn the debris from logging can only be solved by continuing such experiments as the above and studying the lands so cut to see what the effect is on reproduction, diminution of forest fires and on insects and fungi.

A lumberman who has been making a tour of the cutting operations in Ontario, reports that there seems to be a conspiracy on the part of the employment agencies sending men into the woods. The men go in but only stay a few days, sometimes not more than one day, and in one case where three gangs of six men each were used it took an average of 12 men per day coming in to keep the three gangs full. The man who made the report said it looked as if the agencies were splitting up the fee obtained from the employers with the "jumpers." He said conditions were better in the camps than ever before and that wages were high.

Several of the lumbermen's associations in Ontario have passed resolutions urging that the management of the forests of that Province should be placed entirely in the hands of the Chief Forester and his staff.

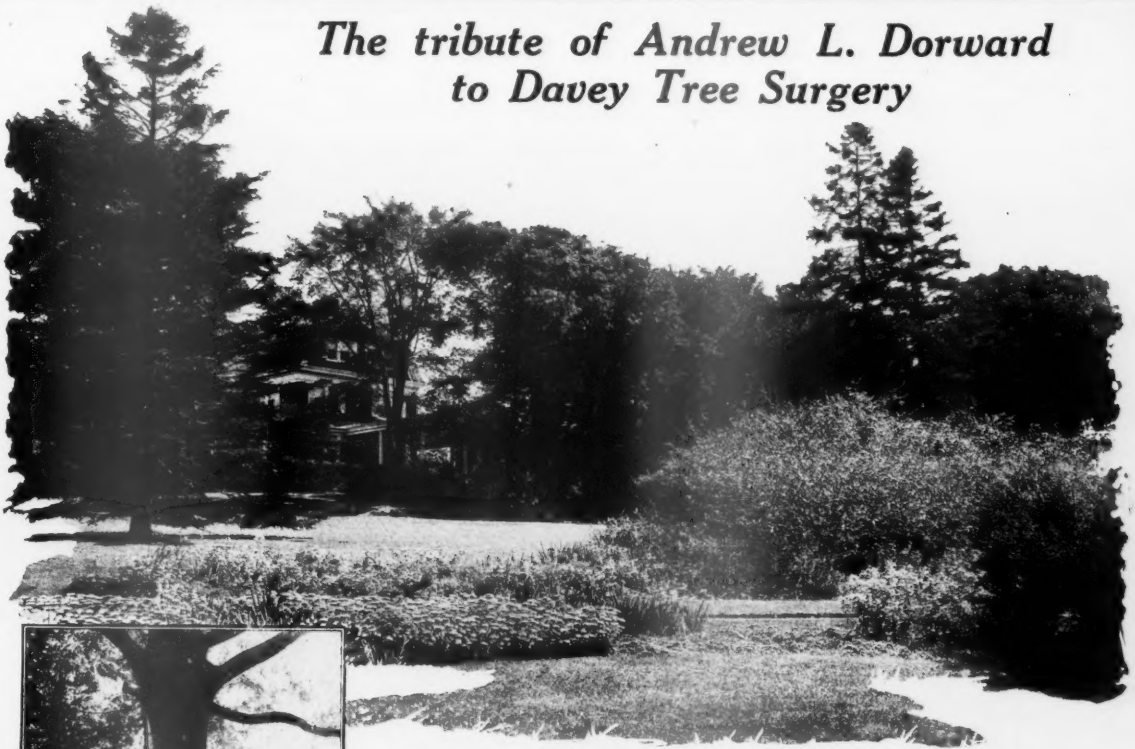
Clyde Leavitt, Forester of the Commission of Conservation, is trying to get an approximate estimate of the supplies of pulpwood standing in Canada. He thinks now that a liberal estimate would be, Quebec 300 million cords, Ontario 200 million cords, New Brunswick 33 million cords, Nova Scotia 30,000,000 cords and British Columbia 255 million cords. Not much information is available for the Prairie Provinces. This makes a total of 818 million cords. The cut is about 2¾ million cords per year. Efforts are being made to find out where this timber is located, that is how much there is which is at present accessible and how much which can only be reached when the price which can be paid for it will cover the cost of transportation. Estimates at present available are little more than the roughest kind of guesses and should not be relied on. It is certainly time to get some more accurate inventory of our resources. The increase in consumption is very rapid and shows no signs of diminishing.

Senior R. Codorniu, editor of *Espana Forestal*, has just published a very interesting book, which is a collection of articles written by him from 1916 to 1918, entitled "Mas Bagatelas Forestales."

Mr. Otto Schierbeck, a Danish forester, who was from 1909 to 1917 in charge of nursery work for the Danish Government, and from then till the present in the nursery business for himself, has just come to Canada to settle. He described to the writer the success they have had in Denmark in inocculating the moths of the white pine weevil with a fungus and liberating them to spread the disease.

The Curtiss Aeroplane Company are working on the designs for a flying boat especially for forest patrol and mapping work. This plane will probably be fitted with two engines.

# *The tribute of Andrew L. Dorward to Davey Tree Surgery*



*The estate of Mrs. T. J. Emory at "Mariemont," Middletown, R. I., is one of the show places around Newport. Andrew L. Dorward is gardener on this estate*

*This photograph shows how healing is well under way within a few months after treatment. Note, also, how concrete has been filled in the cavity by the Davey sectional method, which allows for swaying and prevents cracking*

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Middletown, R. I.

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Andrew L. Dorward, *Gardener*
Mrs. T. J. Emory Estate

*JOHN DAVEY*
*Father of Tree Surgery*

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**PHILADELPHIA**

At the annual meeting of the Canadian Forestry Association and at a subsequent meeting of the Directors a report for the year showed the Association in good financial condition with a large increase in membership. Mr. C. E. E. Ussher, of the Canadian Pacific Railway was elected President and Mr. Dan McLachlin, of Arnprior, Ontario, Vice-President. The number of Directors was increased by ten. Mr. Arthur Meighen, Minister of the Interior, was chosen as one of the new ones. A resolution was passed as follows:

"RESOLVED, That the Canadian Forestry Association desires to place itself on records as heartily approving of the expressed intention of the Government of Ontario to bring its Department of Lands and Forests up to the highest possible state of efficiency."

A very interesting conference on the Fur Industry of Canada, under the auspices of the Commission of Conservation, was held in the Windsor Hotel, Montreal, on February 19 and 20.

Forestry has lost a good friend in the death of Dr. C. Gordon Hewitt, head of the Department of Entomology in the Dominion Government. Dr. Hewitt was much interested in the protection of wild life and was one of Canada's representatives in framing the migratory birds treaty. His support of investigation work in forest entomology has been of great value to the whole subject of forest protection.

## AMERICAN LUMBER ASSOCIATION

FORMATION of the American Lumber Association by leading wholesale lumber dealers of the United States, and declared to be the greatest lumber organization in the world in scope, capital and business represented, was effected in New Orleans early in March. The new association began operations the latter part of the month, with headquarters in Chicago. Its membership comprises wholesale lumber dealers in all important American cities, with selling connections in all parts of the world. L. Germain, Jr., head of a large concern that bears his name in Pittsburgh, Pennsylvania, has been selected as president of the American Lumber Association, and L. R. Putnam, of New Orleans, who resigns as director of advertising and trade extension for the Southern Pine Association, has been appointed manager. Mr. Germain also is president of the National Bureau of Wholesale Lumber Distributors, which was formed to serve the lumber needs of the United States Government during the war. According to Mr. Putnam, who made the announcement of the formation of the wholesalers' association, the same style of organization that handled the lumber situation for Uncle Sam during the war in the new association is enlarged in scope to meet the demands of world trade and to give the lumber consumer the same benefits that were enjoyed by the Govrnment in war times.

## NEWSPRINT PAPER AND PULP WOOD

THE Department of Agriculture prepared information on newsprint paper and pulp wood for the Senate Committee on Agriculture and Forestry, and from it the following statements have been culled:

The use of pulp wood in the manufacture of newsprint paper has been developed only in the last 50 years.

Of all the paper used in the United States 22 per cent is used by the newspapers.

Before the war newsprint paper sold for about 2 cents a pound; now it sells in large quantities for 5 cents a pound and in small quantities up to 10 cents a pound.

In the last 20 years the use of newsprint has increased more than 200 per cent, while in the same period the population has increased 70 per cent.

Demand for newsprint will increase, instead of decreasing, in the future.

Dependence upon foreign supplies of pulp wood for newsprint means we will be at the mercy of foreign manufacturers as to prices. All exports of pulp wood from Newfoundland have been prohibited.

All exports from Crown lands in Canada have been prohibited.

Ten years ago the United States produced its entire newsprint supply; now we import two-thirds of it. Only one-third of the newspapers issued in 1919 were printed on the product of American forests.

Only one newsprint plant has been constructed in the United States since 1909.

Most of the pulp wood for newsprint is secured from New England and the Lake States. Spruce is used for more than half of it.

High cost of pulp and paper mills prevent manufacturing plants from following the timber as do saw mills.

Much pulp wood has now to be freighted 500 miles to the mills.

We bought nearly 1,400,000 tons of pulp wood from Canada in 1918, and prices advanced from $10 a cord to as high as $25.

Canada has increased her pulp mills 57 per cent in the last 10 years.

Indications are that supplies of pulp wood timber in New England and New York will be exhausted in 20 years. In New York alone supplies will be gone in 10 years.

In these sections the annual cut is about three times the annual growth.

There has been practically no development of the paper-making industry in Alaska and the Pacific Northwest, where our remaining timber supplies suitable for pulp wood are located.

At the present rate of cutting in Canada the supply in her Eastern provinces will be exhausted in 25 years.

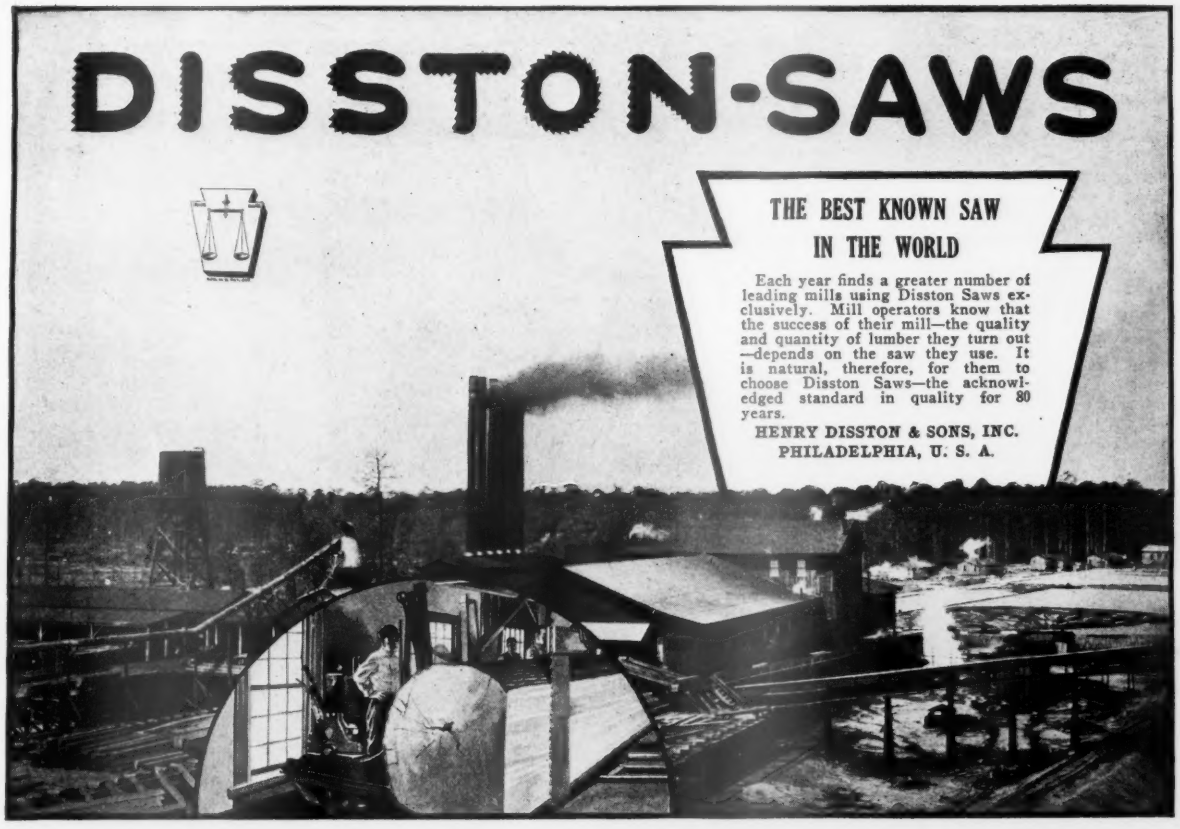
Relief may be had by:

Developing the industry in the Northwest and in Alaska.

By perpetuating forests in the East and reproducing pulp wood timber in them.

Possibly by the collection and repulping of newspaper and its re-use by mixing with it new pulp.

# DISSTON-SAWS



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I need a copy of **Forestry and Irrigation** for March, 1904. Will anyone who can furnish a copy please write me promptly? I should also like to hear from anyone who can supply copies of **The Forester,** bound or unbound, before December, 1900. I have quite a number of duplicates of **Forestry and Irrigation, Conservation** and **American Forestry,** the oldest being December, 1902, and should like to get in touch with anyone wishing to complete their files.
**GORDON PARKER, Colorado Springs, Colo.**

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# STATE NEWS

## CALIFORNIA

NEARLY 56,000,000 feet of timber, worth some $132,000, was the toll exacted by the more than 1,100 fires within the National Forests in California last year, according to District Forester Redington. And this in spite of the fact that 880 of the 1,100 fires discovered and fought by Forest Rangers were kept to less than 10 acres each. The Shasta Forest in Siskiyou and Shasta counties suffered severely, with a total of more than 28,500 acres burned, over 12,000 of which was in private ownership. Actual damage to timber was also greatest on the Shasta, for fires here destroyed $34,000 worth of Government and $42,000 worth of private stumpage.

The largest burned acreages, according to Forest officials, were in the brush country of the Angeles and Santa Barbara Forests in Southern California, where over 200 square miles of mountain watersheds were denuded of their vegetation.

Fires outside the National Forests destroyed timber and range worth, according to State Forester Homans, more than $386,000. This figure does not include damage to grain and hay, which totaled over $350,000, nor to improvements, valued at nearly $190,000.

The season of 1919 was considered the worst in California since 1910, Forest officials state.

## ILLINOIS

ALTHOUGH 30 per cent of Illinois was originally covered by trees, two-thirds of this primitive forest area has been deforested, a good deal of it to its own injury and to the disadvantage of its owners, according to State Forester Robert B. Miller, who has entered upon his duties at the University of Illinois. With a view to establishing a permanent forestry policy for Illinois, a forestry survey of the State has been started. The objects of such a survey are, Mr. Miller states, to ascertain present conditions and values of our existing forests in order to know which of them should be permanently kept as forest properties and which may be more profitably cleared up, now or later, for agricultural purposes; to find forest tracts available, under cooperative management, for demonstration purposes; to select forest tracts which the State should acquire as permanent sources of supply to Illinois industries; to study the uses and values of the farm wood-lot as a feature in the management of Illinois farms; to study the advantages and disadvantages of the use of woodlands for pasturage by cattle, hogs and sheep; to study the geographic and local distribution within the State of the most important trees with a view to a choice, for preservation, maintenance and cultivation, of the kinds best adapted to each set of local conditions; and, finally, to study the relation of Illinois forests, and of their removal, to the problem of permanent water supplies, to the occurence of floods in streams, and the maintenance of underground waters at levels which will prevent their recession beyond the reach of crop plants in times of drouth.

The office of the forester, being at the University of Illinois, affords many opportunities for helpful conference and cooperation, especially with the topographical survey made by the Geological Survey of the State, the soil survey conducted by the Agricultural Experiment Station of the University, the Farm Management Bureau of the Experiment Station, the county farm advisers and the Extension Service—all located at the University.

## LOUISIANA

THE Louisiana Department of Conservation, through its Division of Forestry, has recently given out its estimates of the amount of cut-over land of various kinds in the State. Heretofore in speaking of the cut-over land problem in Louisiana it has been necessary to use general terms and to employ figures which were at best very rough estimates. While the figures of the Department of Conservation are not claimed to be absolutely correct, they are based upon the most recent tax estimates, checked by the United States census, and various other sources of information; they are felt to be substantially correct. These figures show that on January 1, 1918, there were 12,260,000 acres of cut-over land in Louisiana, of which 8,195,000 acres are pine land, 2,685,000 acres hardwood land, and 1,380,000 acres of cypress swamps. All of these figures are exclusive of former forested land which has been cleared and put to agricultural use, or converted into pastures. In 1907 the number of cut-over acres is estimated to have been 7,895,000. This is a 50 per cent increase in 11 years. The department estimates that in the neighborhood of 5,000,000 acres of cut-over pine lands are practically without second-growth, although with proper fire protection more than half of this area, and perhaps as much as two-thirds, would reproduce naturally because of the presence of seed trees. Probably 3,000,000 acres in North Louisiana bear stands of second-growth pine and hardwoods, in some cases very fine stands. In announcing these figures on cut-over land areas Commissioner M. L. Alexander calls attention to the fact that whereas timbered lands are assessed at anywhere from $15 to $235 an acre, the cut-over lands are worth only $2 to $9. With the cut-over acreage increasing yearly by between 250,-

000 and 300,000 acres, there is a staggering loss in taxable values every year.

The annual forest fire report of the Department of Conservation shows the loss from fires during 1919 to have been the smallest in a great many years. While no fire records were kept prior to 1916, it is probable that not since 1905, when 75 inches of rain fell in the State, has so small an area of forested and cut-over land been burned over. A rainfall of 69 inches is, of course, chiefly responsible for the small loss, although in the portions of the State where fire patrol was maintained the State's campaign against fires has evidently borne fruit. 275,000 acres are said to have burned over, all in the long-leaf pine region. About two-thirds of this area was cut-over land, and the total damage of $130,000 was distributed as follows: To standing timber, $23,000; to young growth, $96,000; to grazing, $10,000; and to improvements, $1,000. This damage was done by 897 fires. The causes of the fires make an interesting study. 13 per cent was attributed to railroads, 17 per cent to lumbering, 5 per cent to brush burning, 4 per cent to hunters and campers, 3 per cent to miscellaneous causes, and 58 per cent to incendiarism. These per cents are for those fires the cause of which were known; as a matter of fact, nearly 88 per cent of the fires were of unknown origin. The very high percentage of incendiarism is due to the fact that three-fourths of the fires occurred during the Spring, at which time it is still the practice of many stockmen to burn off the old grass with the mistaken idea that it improves the range. Another source of incendiarism is the desire of knot gatherers and wood haulers to get rid of the tall grass which hides the material they are seeking. The State spent $4,750 for fire control in 1919, and received $2,100 from the United States Forest Service under the Weeks law for the same purpose. From one to thirteen men were on patrol at various times during the year.

A preliminary report on a study of the cost of logging and milling small timber was made public for the first time by the Department at the Southern Logging Congress in New Orleans in October. Some very interesting figures were presented, showing the extreme costliness of lumber from small trees of 12 inches in diameter and less, as compared with the cost of lumber from medium and large sized trees. For example, the cost of felling and sawing was three times as much per thousand for 8-inch trees as for 16-inch; skidding 7-inch logs distances up to 200 feet cost five times as much per thousand feet as for 14-inch logs; the cost of sawing 7-inch logs in the mill was nearly 90 per cent higher per thousand than for 14 per cent logs. The department intends to gather more and better information along the same lines, the figures as given out being preliminary and tentative. In connection with the study an attempt was made to approximate the over-run on logs of various sizes by actual tests at the mill.

Blasting stumps is easy
—grubbing is drudgery
To remove a stump by grubbing and horse pulling is a back-breaking, killing job. When at last the stump is out, the job is but half done. The big, heavy chunks must be disposed of.
Compare this kind of stumping with that described by Mrs. J. R. Cronister, of Jeanette, Penna., who writes:
"We read the book, 'Better Farming.' The pictures and directions made everything so plain. You surely are right in saying Atlas Farm Powder is the easy way to get rid of stumps. It is so much easier than any other way we ever tried."
Let us send you the book, "Better Farming with Atlas Farm Powder," mentioned by Mrs. Cronister. Its 128 pages and 140 illustrations show how to use Atlas Farm Powder to remove stumps, break boulders, blast beds for trees, make ditches and drain swamps.
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## NEW YORK

AN appeal to the Legislature to extend the jurisdiction of the Conservation Commission of New York State to all the Forests of the State along lines similar to those upon which it is now exercised in the Adirondack and Catskill sections, is made in that part of the Commission's report relating to the work of the Division of Lands and Forests. Commissioner Pratt points out that the total area of farm woodlots in New York State is only slightly smaller than that occupied by the great Adirondack Forest, and that with a proper administration of the land best adapted for timber production, New York State should eventually be able to supply a large part, if not all, of its timber needs.

A special campaign to encourage the broadest possible recreational use of the State Forest Preserve and the St. Lawrence Reservation is being made by the Commission as "a public service of the greatest importance." Seven free illustrated "Recreation Circulars" have already been issued, and if funds are made available the work of improving and marking trails, the building of open camps and the construction of fireplaces throughout the Forest Preserve will be undertaken on a scale commensurate with the great use that the people are making of this public property.

Eleven new steel observation towers erected during 1919 bring the total number of such towers in use to 50, and leave only 4 of the Commission's fire stations still to be equipped with standard towers. The 266 forest fires reported by the observers in the Adirondacks and Catskills did damage to the extent of only $3,825, which is less than in 1918, and far below the average.

Additions during the year to the area of the Forest Preserve, which now totals 1,886,500 acres, were made at an average purchase price of $13.48 per acre in the Adirondacks and $6.26 per acre in the Catskills.

# BOOKS ON FORESTRY

**AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.**

| | |
|---|---|
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| FOREST REGULATION—Filibert Roth | 2.00 |
| PRACTICAL TREE REPAIR—By Elbert Peets | 2.35 |
| LUMBER MANUFACTURING ACCOUNTS—By Arthur F. Jones | 2.10 |
| FOREST VALUATION—By H. H. Chapman | 2.50 |
| CHINESE FOREST TREES AND TIMBER SUPPLY—By Norman Shaw | 2.50 |
| TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS—By John Kirkegaard | 1.50 |
| TREES AND SHRUBS—By Charles Sprague Sargent—Vols. I and II, 4 Parts to a Volume—Per Part | 5.00 |
| THE TRAINING OF A FORESTER—Gifford Pinchot | 1.35 |
| LUMBER AND ITS USES—R. S. Kellogg | 2.15 |
| THE CARE OF TREES IN LAWN, STREET AND PARK—B. E. Fernow | 2.17 |
| NORTH AMERICAN TREES—N. L. Britton | 7.30 |
| KEY TO THE TREES—Collins and Preston | 1.50 |
| THE FARM WOODLOT—E. G. Cheyney and J. P. Wentling | 1.75 |
| IDENTIFICATION OF THE ECONOMIC WOODS OF THE UNITED STATES—Samuel J. Record | 1.75 |
| PLANE SURVEYING—John C. Tracy | 3.00 |
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| FOREST PRODUCTS—By Nelson Courtlandt Brown | 3.85 |
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| PRINCIPLES OF AMERICAN FORESTRY—Samuel B. Green | 2.00 |
| TREES IN WINTER—A. S. Blakeslee and C. D. Jarvis | 2.00 |
| AMERICAN WOODS—Romeyn B. Hough, 14 Volumes, per Volume | 8.00 |
| HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS—Romeyn B. Hough | 6.00 |
| GETTING ACQUAINTED WITH THE TREES—J. Horace McFarland | 1.75 |
| HANDBOOK OF TIMBER PRESERVATION—Samuel M. Rowe | 5.00 |
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| PRACTICAL FORESTRY—John Gifford | 2.50 |
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*** This, of course, is not a complete list, but we shall be glad to add to it any books on forestry or related subjects upon request.—EDITOR.**

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### OREGON

HOWARD J. EBERLY, of the State Forester's office, is a member of the Special Forestry detachment in attendance upon the Aviation School at March Field, California. This detachment also includes a number of United States Forest Service men from Districts 1, 5 and 6. A short, intensive course of study, embracing observation, airplane photography, mapping and radio work is being pursued by these men and is especially designed to give fundamental instructions covering airplane forest patrol work. Enlisted pilots are also receiving special training calculated to make them valuable in the extensive plan of the air service to provide airplane patrol for the timbered areas of the entire Northwest during the ensuing season.

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If the lack of snow in the Cascade and Coast Mountain ranges is the barometer of a dry and hazardous fire season, the 1920 situation gives promise of record-breaking possibilities. Within the last few weeks a small amount of snow has fallen, but all of the usual heavily packed early snows have disappeared. Light and fluffy in nature, this slight recent snow will have trickled away before the season's patrol work is actually begun.

A present ten-inch shortage of normal rainfall would seem to add to the peril of the situation, but may, in the compensating nature of the elements, induce a rainfall late enough to partially offset the shortage in snow. With the usual wide and oftimes unexpected variety of weather, there is probably no occasion for alarm just yet, but it is not doubted that a greater sense of safety prevails with an abundance of snow in the mountains.

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### HIGHER PAY FOR FORESTERS

THE minimum entrance salary for Forest Assistants in the Federal Forest Service has been raised from $1,100 to $1,500 per annum, according to a recent announcemen. It is expected that this action will enable the Forest Service to secure graduates from the various forest schools. For the past few years men have been going into private work, owing to the inadequate salaries paid by the Government.

**HOYT'S ANTISEPTIC**
**TREE VARNISH**
A dependable material for keeping fungi and vermin out of TREE WOUNDS while natural healing takes place.
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### TENNESSEE FORESTRY ASSOCIATION

A MEETING of much importance to the State of Tennessee was recently held in Nashville, the second annual conference of the Tennessee Forestry Association. Delegates from all sections of the State were in attendance, both men and women. The Association, only a little more than a year old, may be said just to have begun its work, but the spirit of the meeting throughout was that of appreciating the forestry problems of the State. After the opening address by the president, J. M. Overton, the Governor of Tennessee, Hon. A. H. Roberts, spoke on the Forests of Tennessee, in which he recognized the vital force which they are in the life of a State, and referred also to the necessity of applying scientific methods in the proper handling of them.

Col. H. S. Graves, Chief Forester of the United States, gave a most comprehensive address on the forest conditions in Tennessee and the entire country. He called attention to the important place Tennessee holds in the production of hardwoods and emphasized the great destruction and depletion of forest growth, the decreased output of lumber in Tennessee, and its consequences, there being less than half the amount of lumber produced now in the State compared to that of a decade ago. In the face of the recognized constant, useless depletion of the forest resources of the country, Colonel Graves stressed the futility of expecting a continuous adequate supply of forest products, unless they are assured through the operation of a national policy of forestry. In completing the program for the meeting, R. S. Maddox spoke on the subject of a "State Forest Policy," in which he mentioned the present status of forestry in Tennessee and also some measures which the State now needs.

Among the resolutions adopted was the following: "That the Tennessee Forestry Association favors a broad policy of forestry for the nation, looking to concerted action by the national Government, the States and private owners, to stop the destructive agencies that are injuring and devastating our forests; and that in working out such a policy there should be full recognition of the responsibility of forest owners to do their part in fire protection, and in encouraging natural replacement after cutting; also of the responsibility of the public to co-operate with owners so as to make these policies feasible and practicable."

### MAPLE SYRUP IN THE SOUTH

THE Department of Agriculture states that many "sugar bushes" or maple sugar tree groves are found in North Carolina and Tennessee. The owners have not always had full knowledge of their value. For instance, the Department tells of one maple grove in North Carolina larger than any in New England, the trees in which were formerly cut and sold for lumber at $1.00 each. The sugar producing quality of the trees becoming known, they were tapped and last year yielded syrup that sold for $4.00 per gallon. Yet the world has considered Vermont as the source of all maple syrup, real and imitation, because Southern maple sugar has carefully concealed itself.

### NATIONAL FORESTS NEED ROADS

THIRTY thousand miles of road, estimated to cost not less than $150,000,00, will be needed for the proper protection and development of the National Forests and the near-by communities during the next 10 years, according to comprehensive road plans which have been prepared. The Secretary of Agriculture has already approved the construction of 5,152 miles, estimated to cost $26,463,000, contingent upon Federal and co-operative funds becoming available. Government expenditures of $15,740,000 have been authorized for this purpose.

The roads comprised in the comprehensive road plans form the basis of the ultimate National Forest road system. They are used as main highways, either in connection with through routes or to serve important local needs. The construction of feeder roads is being largely postponed until the primary road system of the National Forests is completed. It is expected that the present estimate cost will be largely exceeded when surveys are made of the projects now on the list, since in many cases the only available estimates are based upon incomplete data.


# THE HISTORIC TREES OF MASSACHUSETTS

**BY JAMES RAYMOND SIMMONS**

**Secretary, New York State Forestry Commission**

**The author has written a brief historical treatise covering the period previous to the Civil War from the standpoint of trees as witnesses of the events chronicled. He knows his subject and writes in an interesting style with an appreciation of the beauty of trees themselves which he endeavors to inculcate in others. While the trees described are confined to Massachusetts their historic interest has no limitations.**

**The book is made with care. There are forty full-page plates printed in double-tone ink on cameo paper. The type is large, and margins are wide. An appropriate drawing has been made for the cover. Those who have seen the book are enthusiastic in its praise.**

**"A very beautiful book. Its text shows a patient and descriminating study, and its illustrations are superb. Mr. Simmons has done a good work well. His book is a thing of value and beauty."—Hartford Courant.**

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### SALE OF TIMBER QUINAIELT INDIAN RESERVATION MOCLIPS UNIT

SEALED bids in duplicate, marked outside "Bid, Moclips Unit," and addressed to the Superintendent, Taholah Indian School, Taholah, Washington, will be received until twelve o'clock noon, Pacific time, Tuesday, June 1, 1920, for the purchase of timber on the tract in Townships 20 and 21 north, Ranges 11 and 12 west, Williamette Meridian, in Quinaielt Indian Reservation. The said unit includes about 3,560 acres, with a total stand of about 125,000,000 feet, of which about 70,000,000 lies in about 1880 acres of allotted land, as to which separate approved contracts with the Indian owners may probably be made. The sale embraces approximately 70,000,000 feet of cedar, 19,000,000 feet of Douglas fir, 14,000,000 feet of spruce, 20,000,000 feet of hemlock, 1,000,000 feet of white pine, 578,000 linear feet of cedar poles, and an unestimated amount of Douglas fir piles. Each bid must state the price per thousand feet Scribner decimal C log scale, that will be paid for timber cut and scaled prior to April 1, 1924. No bid will be considered for the first period of less than the following rates per thousand feet: Three dollars fifty cents ($3.50) for live and dead cedar; three dollars ($3.00) for live and dead Douglas fir and spruce; two dollars ($2.00) for white pine; eighty cents ($.80)) for hemlock, white fir and other species; per linear foot for cedar poles 45 feet and over in length with not greater than a nine-inch top diameter, one and three-fourths cents (.0175); for cedar poles 45 feet and under in length, one and one-fourth cents (.0125); for cedar poles 20 feet and under in length with not greater than a six-inch top diameter, three-fourths cent (.0075); and for Douglas fir piles, with not greater than a sixteenth-inch butt diameter, one cent (.01) per linear foot. Each bid must be accompanied by a certified check of $10,000. The deposit will be returned if the bid is rejected, but retained as liquidated damages if the required contract and bond are not executed and presented for approval within sixty days from the acceptance of a bid. The right to reject any and all bids is reserved. Copies of the bid and contract forms and other information may be obtained from the Superintendent, Indian School, Taholah, Washington. Prices subsequent to April 1, 1924, will be fixed by the Commissioner of Indian Affairs by three-year periods.

Washington, D. C., March 17, 1920. CATO SELLS, Commissioner of Indian Affairs.

### SALE OF TIMBER, MESCALERO INDIAN RESERVATION, ELK AND SILVER CREEK UNIT

**Sealed bids in duplicate, marked outside "Bid Elk and Silver Creek Unit," and addressed to Superintendent Mescalero Indian School, Mescalero, New Mexico will be received until twelve o'clock noon, Mountain Time, Saturday, May 1, 1920, for the purchase of timber on a tract within the Elk and Silver Creek drainage areas on the southern part of the Mescalero Indian Reservation lying west of the range line between ranges 14 and 15 East of New Mexico Principal Meridian. The said unit includes about 30,000 acres of unallotted timber land with an estimated stand of one hundred seventy million feet as to which contract will be made with the superintendent. Approximately 55 per cent of the timber within the unit is western yellow pine (including so-called "Black Jack" or "Bull Pine,") 30 per cent Douglas fir and 15 per cent white fir, Mexican pine and Engelmann spruce. Each bid must state the price per thousand feet Scribner Decimal C Log scale that will be paid for timber cut and scaled prior to April 1, 1925 Prices subsequent to that date are to be fixed by the Commissioner of Indian Affairs by three year periods. No bid of less than three dollars ($3.00) per M feet for yellow pine and Douglas fir, two dollars ($2.00) per M feet for Mexican white pine and Engelmann spruce and one dollar ($1.00) per M for white pine during the period ending March 31, 1925 will be considered. Each bid must be accompained by a certified check on a solvent national bank, payable to the Superintendent of the Mescalero Indian School in the amount of ten thousand dollars ($10,000.00). The deposit will be returned if the bid is rejected but retained as liquidated damages if the required contract and bond are not executed and presented for approval within sixty days from the acceptance of a bid. The right to reject any and all bids is reserved. Copies of the bid and contract forms and other information may be obtained from the Superintendent, Indian School, Mescalero, New Mexico.**

**CATO SELLS,**
**Commissioner of Indian Affairs.**
**Washington, D. C., February 14, 1920.**

### FORESTER SAVING CZECHO-SLOVAKS

THAT a former District Forester of the Arizona-New Mexico district has directed the work of saving half a million children from starvation is the word brought from Czehco-Slovakia in a letter from the Czech Government requesting from the Forest Service an extension of leave for Capt. Arthur C. Ringland, formerly District Forester of the Southwestern District, with headquarters at Albuquerque. The letter is addressed to the Director of the European Children's Fund of the American Relief Administration, and is signed by Dr. Alice Masaryk, daughter of the President of Czecho-Slovakia, and by two high ministers of the Government. The letter is in part as follows:

"The American nation has saved about half a million Czecho-Slovakian children from starvation in the most critical time before the harvest of 1919. The national organization of the "Cezkoslovenska Pece o dite," with the President of the Republic as head and all Ministers of the Cabinet as members of the National Committee, is distributing the American food to the remotest districts and places of our country. The soul of this organization, unique in the history of our nation, is Mr. Arthur C. Ringland, one of those excellent workers whom you sent to Europe to accomplish your wonderful plan to help small nations and enable them to face the consequences of war."

### FOREST FIRES IN CALIFORNIA

THE Forest Service has been able in California, through comprehensive plans, complete organization and execution, and co-operation from timber owners and the public, to reduce in the past 12 years the annual fire destruction of merchantable timber in the National Forests in that state by 81 per cent or some 94 million feet. That fires started by lightning were of common occurrence in the pine forests of northern California as early as 1530 is a fact established, says the District Forester at San Francisco, by the examination of old fire scars on still living trees. Naturally none of the trees examined had survived every one of the many fires recorded in the past two or three hundred years but several bore scars from which were traced the occurrence of more than 20 conflagrations each one separated by a number of years. One tree, the oldest examined in Plumas County, has very evidently survived 35 separate and distinct fires. Because it is evident that these fires were not holocausts because much of the area over which they burned still bears merchantable timber, some have questioned the need of extensive fire protection in California forests or of particular attention to the light ground fire. It is estimated, however, that ground fires in California actually destroy on the average, 1183 feet of timber per acre or $4.45 in value.

### TWO-THIRDS OF EACH TREE WASTED

"AT present two-thirds of the average tree is wasted before the wood is put to use," said C. P. Winslow, Director of the United States Forest Products Laboratory, in an address at a recent meeting of the Madison Section of the Society of American Foresters. "Without doubt, a considerable part of this waste can be used," he added, "and it is the function of forest products research to develop every possible new use, within the limits of the financial resources available for such work. Such better utilization also has a vital relation to the practice of forestry on private lands, by making possible a greater net return per acre, thus making continuous production of private forests more financially attractive than at present." Among the new uses of wood now being developed which may have profound effect upon future forest production, Mr. Winslow mentioned the use of "built-up" wood, in which small pieces of wood are guled together into laminated parts of various shapes and sizes, which can be made just as strong and useful as an equal amount of solid wood. The increasing uses of laminated wood make it reasonable to assume that many of the forests of the future can be profitably cut at an earlier age than at present with much closer utilization of the trees grown, thus naturally increasing the financial return per acre. The greater utilization of wood waste and wood in the smaller sizes for chemical products and paper pulp was also given as a fertile field for research.

### FORESTERS TEST WIRELESS PHONES

PRELIMINARY tests of the wireless telephone by officers of the Forest Service, United States Department of Agriculture, in the vicinity of Portland, Oregon, lead to the belief that this invention can be utilized extensively in the National Forests, especially in fire-prevention work. While it is recognized that there are conditions limiting wireless telephone transmission, the results so far are pronounced very satisfactory.

One of the sets used in the tests was installed on Mount Hood, Oregon, where the problem of providing a satisfactory support for the antennae was a difficult one, since a mast was needed which would be strong enough to resist the 70 or 80 mile gales that sweep the mountains. At the same time the mast had to be light enough for the men to be able to raise and lower it before and after sleet storms. A 50-foot bamboo pole was finally selected as the support.

In the telephone conversations between the sets, some of which were 10 miles apart, the voice carried very clearly and was about as loud as over a wire line. Telegraph signals from many stations scattered over the continent were picked up. On Mount Hood they often were so loud as to be audible in any part of the cabin.

# FOREST SCHOOL NOTES

### IDAHO FOREST SCHOOL

THE Associated Foresters of the University of Idaho Forest School held their fourth annual banquet March 10, at Moscow, Idaho. Forty members and their guests were present, among the latter being President E. H. Lindley, of the University of Idaho; A. D. Decker and Donald Yates, of the Potlatch Lumber Company, of Potlatch, Idaho, and Major F. A. Fenn, chief of the office of lands in District 1 of the United States Forest Service at Missoula, Montana. Prof. C. Edward Behre acted as toastmaster. Mr. Decker spoke on "The Practice of Forestry by Private Owners," and expressed the opinion that progress along this line could not be successfully secured by mandatory legislation, but that the solution of the national forestry problem lay along co-operative lines. President Lindley, of the University of Idaho, talked upon "The Spirit of the Forester." Mr. A. S. Daniels, president of the Associated Foresters of the University of Idaho, outlined the history, activities and aims of the forest club. Mr. Yates, in discussing the logged-off land problem, outlined an idea for removing and utilizing the waste material on logged-off land for agricultural development by a stock company undertaking the production of fuelwood, resinous by-products and pulp for the utilization of the material now destroyed. He believes that, although no one of these industries can be profitably conducted on the supply of raw material from cut-over land at present, that an enterprise which undertook all at the some time would succeed. Mr. H. W. Staples, of the senior class of the Idaho Forest School, talked on airplane fire patrol, basing his remarks on experience gained as lieutenant in the United States Air Service during the war. Mr. H. W. May, a United States Forest ranger, pointed out the advantage to the field man in coming to the University of Idaho for the short course. Major F. A. Fenn, spoke upon his work with the Forest Service in developing the recreational uses of the National Forests. Major Fenn has the distinction of being one of the first six pupils to attend a public school in Idaho territory and has been in the United States Forest Service for over 20 years. Some of the interesting incidents of the early days of the Forest Service related by Major Fenn were a revelation to those who knew the Forest Service only from its present stage of development and prestige.

### YALE FOREST SCHOOL

THE Fourth Annual Convention of the Intercollegiate Association of Forestry Clubs was held recently in New Haven, under the auspices of Yale, the present President Club. The meeting was in every way a distinct success, and owing to the number of Yale alumni present the occasion partook of the nature of a reunion. The meeting adopted insignia for the Association, provided for a quarterly publication to be issued by the president club, and elected the University of California as president for the coming year. The next convention will accordingly be held in Berkeley.

The speakers and the subjects of their talks were: "The Profession of Forestry," Prof. H. H. Chapman, New Haven, Connecticut; "How Can the Forester Help the Lumberman?" T. L. Bristol, Ansonia, Connecticut; "The Work of the Consulting Forester," J. T. Rothery, New York city; "The Undergraduate Student of Forestry," J. H. Briscoe, Orono, Maine; "The Student of Forestry, and State Service," E. C. Hirst, Concord, New Hampshire; "The Student of Forestry and Research," S. T. Dana, Washington, D. C.

The speakers at the banquet were: Dean Toumey, Colonel Woolsey ('03), Major Marston ('02), E. C. Hirst ('09) and Mr. Rogers, of the Indian Forest Service.

The Senior Class, fifteen in number, has gone to Urania, Louisiana, for the spring field work. The spring work is in charge of Professors Bryant and Chapman, and will be conducted on a large Southern pine operation on the property of Mr. Henry Hardtner. The location selected for the work this year is familiar ground, as the work with the class of 1918 was conducted on the same property.

Dr. H. N. Whitford sailed early in April for six to eight weeks' field work in examining a tract of timbered land in Dutch Guiana. He is planning to secure a full collection of woods and herbarium material from the region visited. Recent additions to the tropical woods collections at the Yale School of Forestry have brought the total of such woods to nearly 4,000 specimens. Representatives of the principal woods of nearly all the South American countries and many other parts of the tropical world are now in this collection. Professor Record, who is classifying these words, is constantly receiving numerous samples from many sources for identification.

Mr. N. M. Matthews, Conservator of Forests for North Borneo, has been a visitor at New Haven for the past several days and gave an interesting address before the Forest Club on the evening of March 16. Mr. Matthews is enthusiastic


# FORESTERS ATTENTION

**AMERICAN FORESTRY will gladly print free of charge in this column advertisements of foresters, lumbermen and woodsmen, discharged or about to be discharged from military service, who want positions, or of persons having employment to offer such foresters, lumbermen or woodsmen.**

POSITION wanted by technically trained Forester. Have had fourteen years experience along forestry lines, over five years on the National Forests in timber sale, silvicultural and administrative work; three years experience in city forestry, tree surgery and landscape work. Forester for the North Shore Park District of Chicago. City forestry and landscape work preferred, but will be glad to consider other lines. Can furnish the best of reference. Address Box 600, Care American Forestry Magazine, Washington, D. C. (1-3)

YOUNG MAN recently discharged from the U. S. Navy, wants employment with wholesale lumber manufacturer; college graduate; five year's experience in nursery business; can furnish best of references. Address Box 675, Care American Forestry Magazine, Washington, D. C. (1-3)

RECENTLY discharged from U. S. Army, young man wants position with a firm who has use for a lumber tallyman and inspector. Has a good education, 11 years' practical experience in lumber and can furnish good references. Address Box 880, care of American Forestry Magazine, Washington, D. C. (3-5-20)

ARBORICULTURIST is open to an engagement to take charge of, or as assistant in City Forestry work. Experience and training, ten years, covering the entire arboricultural field—from planting to expert tree surgery—including nursery practice, and supervision in the care and detailed management of city shade trees. For further information, address Box 700, care of American Forestry.

WANTED—Position as Forester and Land Agent. Technically trained forester, 35 years old. Practical experience along all lines included under the duties of the above positions. Former Captain, Field Artillery. Address Box 840, care American Forestry, Washington, D. C.

WANTED—Position with Lumber Company or Private Concern by technically trained Forester with five years practical experience. Box 820, care American Forestry.

A FORESTRY graduate with several years experience in forest work and at present employed along technical and administrative lines desires responsible position with private concern operating in and outside the United States. Address Box 870, care of American Forestry Magazine, Washington, D. C.

DISCHARGED SAILOR would like position as assistant forester or a permanent position as surveyor with some lumber company with a chance for advancement. Salary is of secondary consideration. Married, so would have to locate in some small town. Have had four years' practical experience in general forestry, and some tree surgery. Address Box 900, care of AMERICAN FORESTRY MAGAZINE, Washington, D. C. (4-7)

## POSITIONS OPEN

WANTED—Working Assistant Forester for local Forestry Department in connection with forestry work in parks, nursery and landscape planting. Good opportunity for ambitious young man not afraid of work. State qualifications, salary expected and references. Address Box 890, care of American Forestry. (3-6-20)

WANTED—Man capable of Supervising Slack and Tight Barrel Plant; Purchase and Inspect Cooperage Stocks; Develop Boxes, Crates and other Packages for miscellaneous articles. State experience, salary wanted and references in first letter. Address Box 123, care of AMERICAN FORESTRY MAGAZINE, Washington, D. C. (4-5)

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over the potential resources of Borneo, and looks forward to great developments in that part of the world in the immediate future. He has just returned from London, where he has been instrumental in floating a large company for the exploitation of Borneo timber.

### FORESTERS AID IN SHADE TREE PLANTING

FOREST Examiner F. S. Baker at a recent meeting of the Society of Intermountain Foresters, at Ogden, Utah, commented on the street trees of Ogden and other Intermountain towns and pointed out the need for careful study and selection of the trees to be used, and proper care of the trees after they are planted. He stated that the practice which obtains of promiscuously chopping off the tops of shade trees, apparently with the idea of making them spread in the top and yield more shade, and of course also to make room for wires, is a pernicious one, which civic organizations should take steps toward abolishing. He also urged that each community should formulate a definite plan for the planting of shade and ornamental trees within its limits, and adhere to that plan. He urged the foresters of the Intermountain region to actively interest themselves in this work and in their travels throughout the region to actively assist community leaders in such work. He also urged that careful study of existing situation should be made with a view to securing accurate and complete data on the trees best adapted to the different parts of the Intermountain region, in order that the foresters may be of greater assistance to communities and individuals who are constantly applying for such assistance in developing this community activity.

### GROWING NATIONAL FOREST RECEIPTS

RECEIPTS from the National Forests for the seven months ending January 13, 1920, totaled $1,418,144.18 as against $1,111,321.21 for the same period of the last fiscal year, according to reports to the Forest Service, United States Department of Agriculture. This is an increase of $306,822.97. Timber sales show the largest increase, $271,175.42. Water power comes next, with $17,450.54, followed by special uses, $7,600.61; and grazing, $7,022.23.

### FORESTERS FROM INDIA TO COME HERE

A representative of the British Government visited the Forests Products Laboratory at Madison recently to arrange for a later visit of 12 forest engineers whom England is sending to India to establish a forest policy there and to solve problems of reforestation, wood utilization, etc., in that richly forested country. They will make a tour of the United States in the summer and will spend some time at the Forest Products Laboratory studying methods, tests, etc.

### MILLION TREES FOR NEBRASKANS

MORE than a million trees from the Bessey Nursery at Halsey, Nebraska, have been distributed among 5,080 people by the Forest Service, United States Department of Agriculture, since 1912. Those receiving the trees are residents of the Kinkaid enlarged homestead district, a special provision in the act creating this district having provided that the residents should be entitled to receive trees from the Forest Service. Recently steps have been taken to get the largest benefit from the distribution of trees by arranging with the county agents in the districts to receive applications for trees, to assist in planting trees, and to make annual reports regarding the condition of trees coming under their notice.

### FORESTRY LECTURES FOR TEACHERS

THE school children of Denver are enjoying special opportunities to learn much of value regarding practical forestry problems. A local representative of the Forest Service of the United States Department of Agriculture is giving a series of lectures on subjects relating to forestry to 200 Denver school teachers who, in turn, pass on the information to their classes. The lectures are illustrated and deal with fire protection in the forests, forest improvement, grazing, tree planting, game preservation and similar topics. Work of a somewhat similar character is also being carried on by a forest ranger in Portland, Oregon, who has arranged to give talks to the Boy Scout troops in his vicinity.

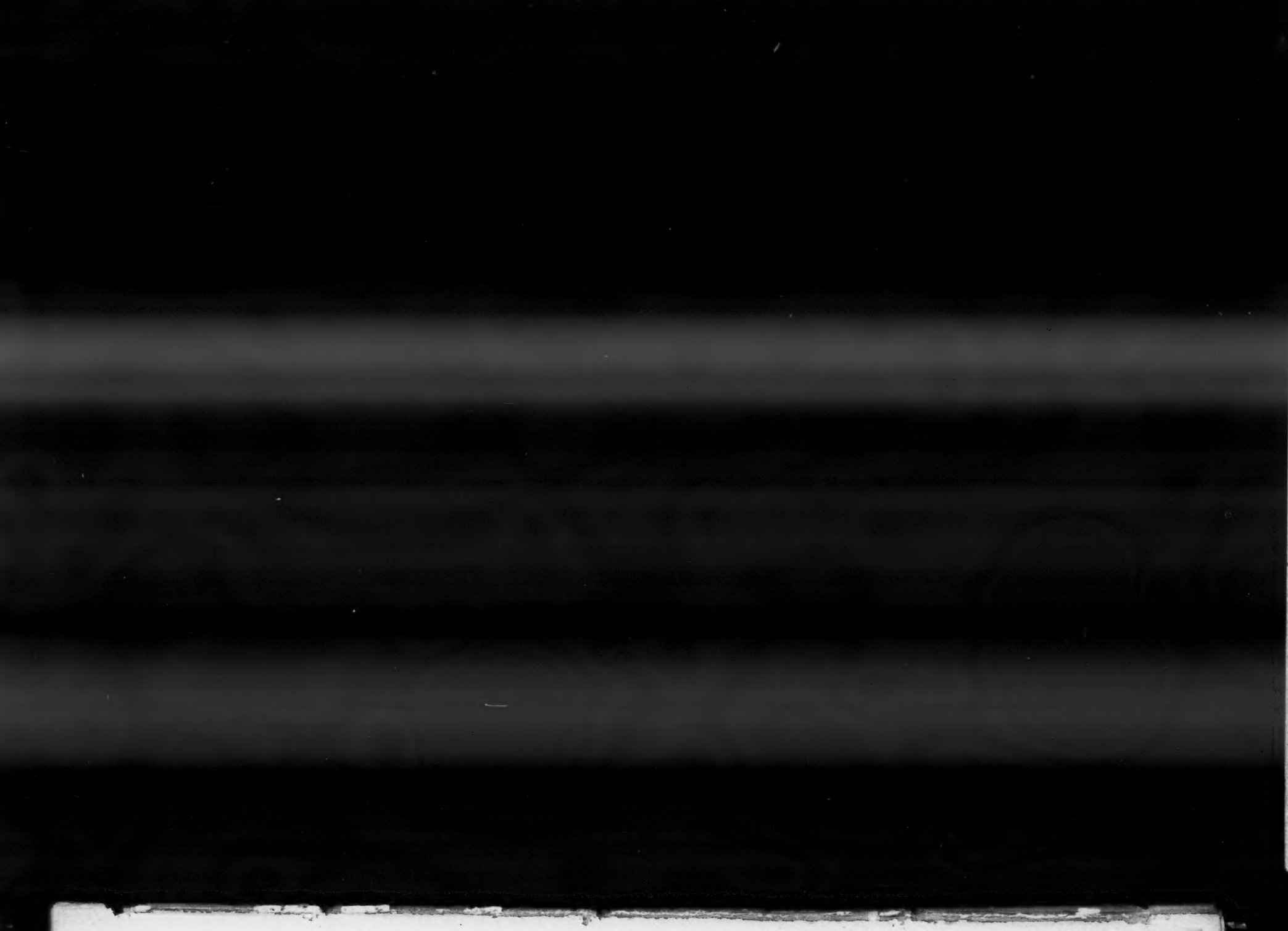
### CREOSOTE SOFTWOOD POSTS

THE present high prices of fence posts make it necessary to find something cheaper that can be found near home. Professor G. B. McDonald of the forestry department at Iowa State College has found that softwood posts when treated with some preservative will last as long as the hard wood posts and the only expense is the work of cutting and the preservative used.

Posts to be treated must be peeled and seasoned. An unseasoned post will not take the creosote well and after seasoning in the ground wide cracks open up deeper than the preservative penetrated and decay will start.

### FOR A FOREST POLICY

AT the recent annual meeting of the Western Retail Lumbermen's Association resolutions as follows were adopted:

"That the Governors and Representatives in Congress of the Western States be asked to assist in bringing about legislation to formulate a broad national policy of early reforestation of denuded areas in these States.

"That the plan for the establishment of field posts in the National Forests be endorsed and that Congress be urged to provide a reserve line of defense for Forest Service patrols."